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SKYWAYS

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XF-85 Parasite Fighter ☆ Pilot Rep

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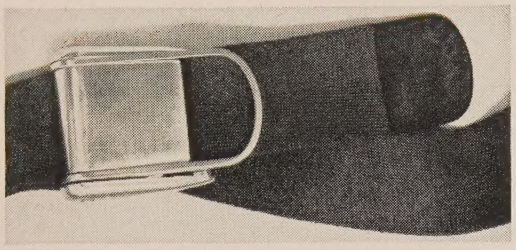
PAC Has It!



An outstanding aid to safe flying made available through Pacific Airmotive is the new, stronger, more convenient PAC safety belt. This belt meets the greatly increased shock and stress-load standards of the National Aircraft Standard Committee's Specification 802, and also meets the quick-release requirements of this safety code.

The Crash Injury Research Project of the National Research Council has found that stronger safety belts would prevent many injuries. The Aircraft Owners and Pilots Association (AOPA) has advocated that action be taken to provide stronger safety belts, in line with the C.I.R. findings.

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SKYWAYS

Due to conditions beyond our control, a temporary change has had to be made in SKYWAYS' style and type. As soon as the emergency is over, SKYWAYS will again return to its quality presentation.

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Jet School for Airmen ..... Jerry Leichter 14
New training program readies men for jet Air Force

Forsgate for Flyers ..... Wm. A. Price 17
Here's an Eastern oasis for fun-loving private flyers

Pilot's Report — Aeronca Sedan ..... Chase Crawford 20
Pilot gives the nod to the new Aeronca after X-C ferry flight

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New Convair-Liner goes into operation as DC-3 replacement

Plane Sells Property ..... M. W. Exton 24
A salesman finds new and profitable use for a lightplane

Will the Prop Disappear ..... Victor Boesen 26
In this picture of jets, there's still a place for the prop

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Pilot's cartoon strip sells millions on safe, sane flying

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ALICE ROGERS HAGER Washington Corresp.

AUGUST 1948 VOLUME 7, NUMBER 8

The Henry Publishing Company publishes SKYWAYS at 444 Madison Avenue, New York 22, New York. Advertising Offices: 444 Madison Avenue, New York 22, N. Y.; 6 N. Michigan Ave. Chicago 2, Ill.; 816 W. 5th Street, Los Angeles 13, Calif. Gordon Simpson, West Coast Manager. James L. Cunningham, Chicago Manager.

The following publications are combined with SKYWAYS: Air News and Flying Sportsman.

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Spanish Edition: Adolfo Guido Lavalle, Editor-Director, Suipacha 419, Buenos Aires, Argentina.

AIRviews

It is plain that air freight's glamor days are over. "Rushing serum to Nome" is no longer front page news. Today, every hour witnesses emergency deliveries of some kind by the nation's carriers of air freight.

However, such emergency shipments have ceased to be the vital part of the picture. Now the backbone of air freight is the leading merchants and industrial firms who have carefully analyzed their costs and have determined that the use of air freight for normal shipments is currently *saving them money!*

In arriving at this conclusion, the seller or distributor of goods is bound to consider several factors. The basic factor, of course, is *speed.* Air freight's swiftness permits the catching of favorable markets . . . the wide distribution of goods in a matter of hours . . . the ability to keep customers happy and well stocked . . . and savings on inventory, interest-in-transit, and warehousing charges.

Then, too, there are the factors of cleanliness, of reduced cost in packaging and handling, of less loss through breakage. All these factors, plus speed, add up to lower costs . . . better service.

Today, air freight has expanded to such an extent that it has become available to many businesses whose leaders have not yet had a chance to investigate thoroughly its manifold advantages. The fact that many internationally successful industries and merchandising organizations are now using air freight so extensively presages an increasing number of air freight users, for which we in the aviation industry must be prepared.

Donald W. Douglas

PRESIDENT
DOUGLAS AIRCRAFT COMPANY, INC.
SANTA MONICA, CALIFORNIA

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AIR YOUR VIEWS

Query Corner

Gentlemen:

I have been trying to find the address of Vernon Payne, the designer and builder of the famous "Knight Twister." Can you help me? Also, is he building anything now?

G. F. ENGLE, JR.

Mill Valley, California

Vernon Payne may be reached at: Knight Twister Aircraft Corporation, 1708 Tower Grove Avenue, St. Louis, Missouri. Right at the moment, the capable Mr. Payne is busy designing a new airplane which he says will be a very advanced type and high speed. He's aiming at the Goodyear Races, and will welcome interest in this present development—Ed.

Gentlemen:

Just what is the jet power plant of the Douglas D-558-2 *Skyrocket*. Is it the Westinghouse 24-C, or an Allison TG-180?

GEORGE MILLER

San Pedro, California

The Douglas Skyrocket, *designed to test the sonic barrier, is powered by a turbo-jet J-34 (24-C) Westinghouse. At the aft tip of the fuselage there is a rocket engine (Reaction Motors, Inc.,) which affords the* Skyrocket *extra thrust, greater speed.*—Ed.

Gentlemen:

After reading your articles on midget racing planes, we have decided to build one. Could you give us some help regarding agents for acceptable blueprints or the address of the Racing Pilots Association?

R. P. LEVINE

Stevens Tech, Hoboken, N. J.

Haven't much in the way of information for you, but we suggest that you write to one of these three: Vernon Payne, Knight Twister Corp., 1708 Tower Grove, St. Louis, Mo., or to the Goodyear Aircraft Corp., Dayton, Ohio, or to the Racing Pilots Association in Los Angeles, California. Tony LeVier of Lockheed Aircraft is a member of the Racing Pilots Ass'n.—Ed.

•

No Seabee?

Gentlemen:

I enjoyed the album of personal 'planes in the April issue, but what happened to Republic's *Seabee*? It wasn't included.

F. KENDERDINE

Hartford, Conn.

That album included only those personal planes in production or soon to go into production. Republic is no longer building the Seabee.—Ed.

•

Pilot's License

Gentlemen:

I am 21 years old and love to fly, but I can't afford spending $500.00 for flight instruction. Can you tell me if there is a less expensive way to secure a pilot's license?

R. G. FAUL

Newark, N. J.

Our only suggestion is that you investigate the possibilities of joining a flying club in your vicinity. Flight instruction via the club way is somewhat less expensive than other means.—Ed.

•

Pilots aren't the only Dilberts

Gentlemen:

After reading about all the pilots that are Dilberts, I wonder if some aircraft manufacturers aren't Dilberts too?

Not long ago a pilot I knew took a new airplane on an X-C. He stopped at a small field for gas, then took off again. Over terrain not suitable for safe emergency landings his plane's engine quit cold and he crashed. The plane was a complete wash-out, but fortunately the pilot was uninjured.

An examination of the wreckage showed that the engine had failed because the gas cap had been put on wrong. On this particular plane, the vent in the gas cap is supposed to face toward the front of the plane. If the cap is put on with the vent to the rear, a vacuum forms in the gas tank and this results in engine failure. Wouldn't it be sensible to design a gas cap that couldn't be put on any other way than the right way?

Another item that makes me gripe is having the carburetor heat control right next to the gas shut-off valve. This, too, creates an unsafe condition. Even if it is pilot error, so to speak, to grab hold of the wrong switch, why not cancel out that possibility entirely by separating such controls sufficiently so that no pilot error can arise?

Plenty has been said about Dilberts who commit errors, but what about those manufacturers that build booby traps into ships?

G. O. WRIGHT

Springfield, Oregon

All this office can say to your comments Mr. Wright, is "Amen." How right you are Mr. Wright! A sign in the pilot direction however, is that some of the newer planes coming on the market are getting enthusiastic cheers from pilots with an eye out to proper cockpit arrangements.—Ed.

•

Plane Choice

Gentlemen:

Instead of sending Mr. Stech the letters that answer his plane problem, how about publishing them for all of us to see?

M. STEPHENS

Lynchburg, Va.

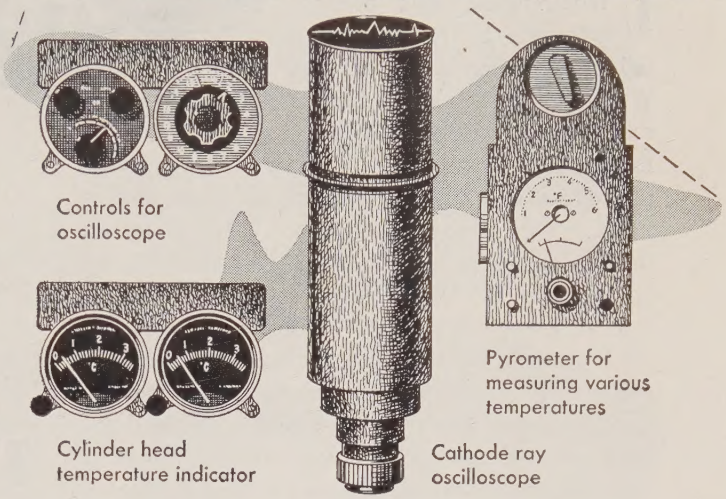
Thank you, Mr. Stephens, for the suggestion. Matter of fact the letters that have come in for Mr. Stech (Air Your Views, June) have been so interesting that we've decided to publish some of them for all readers to enjoy.—Ed.

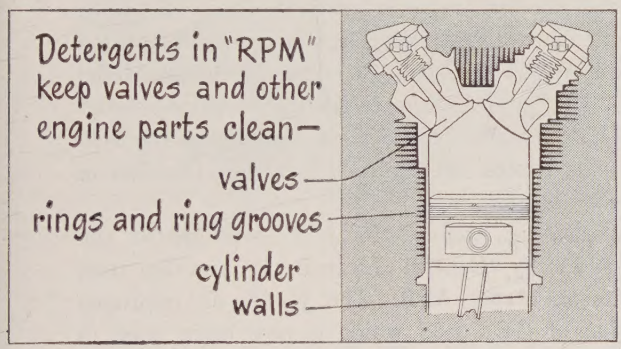
PLANE FAX

A page of service tips for private flyers and fixed-base operators

How to stop overheating at high altitudes

Using specially developed petrolectronic equipment in a series of light plane "flying laboratory" tests, Standard engineers found that highly volatile fuels lean out at high altitudes; cause excessive engine temperatures. Some gasolines actually boiled at 10,000 feet because of an improper ratio of light fractions. The fractions in Chevron Aviation Gasoline, however, are carefully blended in just the right proportions to give you extra protection against vapor lock and overheating at any altitude . . . and insure easy starting, fast take-off and maximum power aloft.





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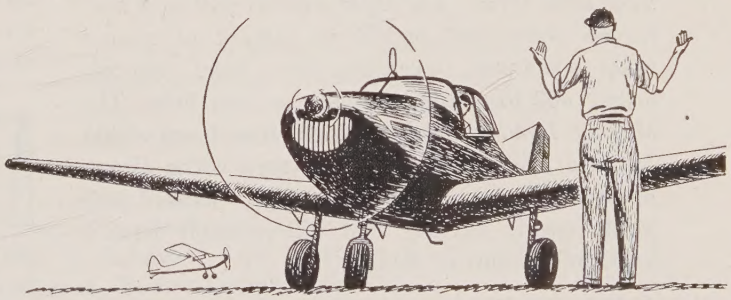
When valves jam and stick, the trouble is often caused by deposits on valve stems. When this happens, hot gasses pit and burn the valve faces and sometimes cause hot spots and hazardous pre-ignition. Use RPM Aviation Oil because it's specially compounded to fight gum and lacquer formations. "RPM" contains a detergent (or cleansing agent) that helps keep rings and ring grooves ungummed, valves and valve guides clean and free of power-robbing carbon.

"Ten point plan" insures top ground service

Standard Airport Dealers operate according to a "Service Procedure Chart" designed to give private flyers standardized, thorough "service station" type service for their planes. This new ten-point plan for taking better care of your plane shows dealers how to save your fuel; gas and oil your plane more quickly and accurately; clean the windshield; inspect the tires, shock struts and other parts for possible damage; and, in general, keep your plane in top condition. Standard Airport Dealers know that safe and pleasant flying depends upon good service on the ground. You'll appreciate the extra service and extra attention that you will receive from Standard Airport Dealers throughout the West.

"Play Safe—File A Flight Plan"



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USAF NEWS

CHARACTERISTICS and requirements for new planes to replace the fighters and bombers used in World War II have been established by USAF. In the fighter category projects are underway on potential prototypes of production models for four distinct types. The *Penetration Fighter,* similar to the fighter-bomber version of the P-51 and P-47, will be required to operate deep in enemy territory against enemy aircraft and ground targets. The *All-Weather Fighter,* known during war as the night fighter, will not only operate at night but also during inclement weather. All-Weather fighters will use automatic gun laying equipment and will carry extensive radio and radar installations. The *Interceptor Fighter,* a high-speed, short-endurance aircraft capable of climbing to 50,000 feet in 2 to 3 minutes, will fly local defense missions against enemy bombers and missiles. The *Parasite Fighter,* such as the recently announced McDonnell XF-85, represents a new approach to the problem of defending very long range bombers. It is designed to be carried in one of the bomb bays of the bomber and released for flight when combat is imminent. It will have folding wings and no landing gear.

The trend in bombardment aircraft is toward three basic types. The *Light Bomber* will be a fast, rugged plane used mainly in support of ground troop operations, operating from bases approximately 400 to 600 miles from the front lines. The *Medium Bomber* will fly missions from bases within 2,000 to 2,500 miles from the target. The *Heavy Bomber* will handle strategic targets located well within enemy territory and will probably have a 5,000-mile radius of action.

SCHEDULED for completion this month is the transfer of General George C. Kenney's Strategic Air Command headquarters from Andrews Air Force Base, near Washington, D. C., to Offutt Air Force Base at Omaha, Nebraska. The strategic location of Offutt near the geographical center of the United States and its excellent communications network were primary reasons for the selection of the site.

Replacing SAC headquarters at Andrews will be the headquarters of MATS, newly created Military Air Transport Service, which moves from Washington's National Airport, D. C.

THE USAF's Air Rescue Service, which operates under MATS, has activated four new air rescue flights at overseas bases, increasing the number of its non-continental units to six. The new flights will fly out of Harmon AFB, Stephenville, Newfoundland; Goose Bay, Labrador; Lagens Field, Terceira Island, Azores; and Kindley AFB, St. George, Bermuda. Other overseas units are at Hahran Field, Saudi Arabia, and at Wheelus AFB, Tripoli, Libya. ARS operates nine search and rescue units within the continental U. S.

THE USAF has authorized release of the J-33-21 jet engine to approved airframe manufacturers for possible use in commercial transport planes. This engine was recently certified by the CAA for commercial transport operation and is manufactured by the Allison Division of General Motors as Model 400-C4. The J-33 was originally developed under USAF sponsorship by General Electric as the I-40 and was turned over to GM's Allison Division in October, 1945.

Another jet engine, the J-47A, designated the TG-190A by General Electric, is awaiting test flights at Muroc AFB. The J-47A, an improved version of GE's J-35 which is now being used in 10 different types of fighters and bombers, is America's most powerful production jet engine with a rated thrust of approximately 5,000 pounds.

NEW types of chevrons and cap, collar, and lapel insignia for enlisted men, and new metal buttons for all personnel have been approved by USAF. The new chevrons will be four inches wide with silver-gray stripes on a dark blue background. They will be V-shaped with the arms curved outward. The V will point downward and will have a silver-gray star on the dark blue background at the bottom. The various grades of enlisted men will wear the same number of stripes as on the present chevrons.

The cap insignia for both enlisted men and officers will be the same as used now, but for enlisted men's wear it will be enclosed in a circle. The size and design of the lapel and coat collar insignia will also remain unchanged, but will also be encircled for enlisted men's wear. The gold-colored metal buttons used on the blouse and overcoat will be changed to incorporate the New Air Force seal.

PLAN FOR SECURITY...

The mission of the United States Air Force is to defend this country against foreign attack. THREE major operational commands synchronize to further this mission. ¶ The Air Defense Command . . . to protect continental United States against air attack. ¶ The Strategic Air Command . . . assigned to intensive, sustained long-range bombardment and fighter operations, alone or in cooperation with land and naval forces. ¶ The Tactical Air Command . . . for attacking enemy aircraft, wrecking hostile troop-lines of communications, and destroying supply concentrations. ¶ Republic's P-84 Thunderjet is designated for duty with ALL THREE commands. The fundamental versatility, ruggedness and striking power of its predecessor, the mighty P-47 Thunderbolt, is inherent in today's 600 MPH THUNDERJET. ¶ Through the closest cooperation between the Air Materiel Command and Republic Aviation Corporation . . . a rapidly increasing number of P-84's are daily going into active service at American Air Bases . . . to guard the security of our nation . . .

REPUBLIC AVIATION CORPORATION, FARMINGDALE, LONG ISLAND, N.Y.

AIR POWER US AAF IS PEACE POWER

"This Is the Year of the Thunderjet"

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NAVAL AVIATION

MALES are interested in models of both the Conover and the aircraft variety. Surprisingly enough it seems that the latter have a larger following! About one thousand of the nation's two million airplane model builders are attending the National Championship Model Airplane Contest August 4-8 at the Naval Air Reserve Station, Olathe, Kansas. Model aviation is an art and a science whose value to America must not be underestimated. From this hobby the youngsters learn so much that a seasoned naval aviator discussing the meet was overheard saying, "I'd like to attend that model meet, but I'm afraid the kids might ask me questions about aerodynamics which I can't answer." These question asking model builders of today are the aviators and aeronautical engineers of tomorrow. It is they who will someday find the answers to aerodynamic questions which no one can answer today. They are America's most valuable segment of potential air power.

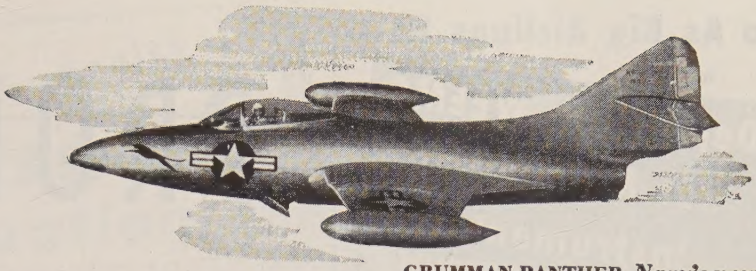
AGAIN naval scientists have made a contribution to man's knowledge which can be as valuable to the civilian as to the military world. Fires resulting from the rupture of hydraulic lines in military combat or in civilian emergency landings are now preventable. After four years of painstaking research based on the common knowledge that water will not burn, scientists of the Naval Research Laboratory in Washington, D. C., under Dr. W. A. Zisman have produced a non-inflammable water-base hydrolube fluid. It will replace the inflammable petroleum-base fluid formerly used in the hydraulic systems which run the landing gear, brake and flap controls of aircraft.

WHAT is a military aircraft but a fast-moving raft for a cargo of guns, rockets, and bombs? And what use is this ordnance if you can't shoot it or drop it exactly where you want it? There's no use gunning if your aim is no good. So, oddly enough, the entire military value of an airplane, its crew, and its fire power is proportional directly to the accuracy of one of the smallest gadgets in the plane, the "sight"! The Navy's very vital Bureau of Ordnance has developed a new triple action adjustable sight which the pilot can reset in flight for use in gunnery, rocket firing, and bombing. Stand from under, Annie Oakley!

THOSE who swelter in the August heat might consider trading places with pilots and ships' crews on a mission in the Arctic Sea. They will unload a full year's supply for the inhabitants of Naval Petroleum Reserve No. 4 which lies near Point Barrow well within the Arctic Circle. The beach on which the seven Navy Ships will make their World War II-type amphibious landing is a solid mass of ice for all but a few short days in mid-August. The ice then recedes from the shoreline under the action of favorable winds and currents. A change in wind direction can move the ice-cap back to the beach and trap the ships. Shore-based reconnaissance planes will be used to forecast ice movements, and the ships will return hastily to the open sea on word from the flying ice watchers. Cool work but hazardous.

FORTY years ago "this man's Navy" allowed some women to join its ranks. The Navy Nurse Corps, an extremely vital and respected unit of the Medical Department of the Navy, now has 29 of its 2,000 members assigned to full-time flight duty. The flying nurses provide hospital care for patients being flown to Navy hospitals from all over the world. The 29 flying angels of mercy are a remnant of the 200 wartime flight nurses who evacuated the wounded from Pacific Islands while the guns were booming. By comparison with the war days these girls call their present flight duties "very routine."

BEST wishes for a happy retirement to that veteran flying leatherneck Major General Ralph Johnson Mitchell. General Mitchell began his career as a flying Marine way back in 1921. In 1930 he flew against Sandino's insurrectionists in the Nicaraguan campaign. At the outbreak of World War II as Director of Marine Aviation he organized the expansion of the Marine air arm for the Pacific campaigns and then himself went overseas to fly against the Japs from Guadalcanal to the Philippines. This flying fighting General has served his country well. Hard-hitting Marine Corps Aviation will miss him.



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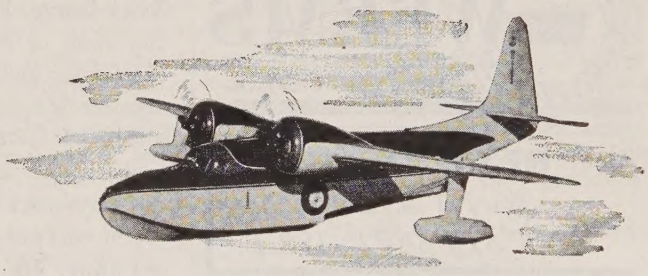

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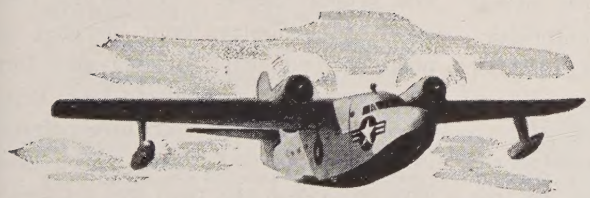

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PROP WASH

Aero Oddities

In a Jam. Captain of a B-17 on training mission called Engineer over intercom, requesting him to come forward. Engineer squeezed through truss in bomb-bay, but release-toggle on his Mae West accidentally caught. Mae West inflated, filling narrow truss and anchoring Engineer. "Blown-up" Engineer was rescued 30 minutes later when crewman came to find out what had delayed him. (*I. F. Stride, Frederick, Maryland*)

Fire Spotter. Pilot flying over Tennessee for first time spotted farmer's barn smoking. When buzzing did not attract attention, pilot landed his *Cub* in field nearby, hurried to tell farmer his barn was on fire. Farmer calmly replied, "Nope, Son, just curing some of our tobacco!" (*S. Patchett, Valier, Illinois*)

Quick Leave. Pilot landed at old military base in France, hurried to edge of field for look at an abandoned German jet Messerschmitt. Climbed into cockpit to investigate equipment. Suddenly there was loud explosion and curiosity-stricken pilot came zooming out of cockpit to land in grass several feet away. He had released automatic-ejection seat. (*J. Duquet, Grasse, France*)

Come Again? While flying over poorly air-marked Kentucky, pilot became lost. After several minutes of floundering, pilot finally spotted water tower with some marking on it. He zoomed down to get a better look, and read the large white letters, "Kilroy was here, too!" (*J. F. Helderman, Charleston, W. Va.*)

First Call. Enroute to home airport in newly purchased air ambulance, pilot spotted jam-up on highway and crowd of people. Noting two lying on grass, pilot attracted attention of highway patrolmen, landed plane on road and then took injured to airport in town. (*B. Walker, Springfield, Mo.*)

Not Quite. Pilot getting checked out in Grumman TBF was asked if all things were okay for take-off. When he replied everything all right, instructor pointed to ship's wings, still folded neatly back against plane's fuselage. (*J. G. Aljano, Fresno, California*)

Hole in One. Freak twister struck airport at which were lined up three Republic *Seabees*. Wind picked up middle ship, lifted it over 10-foot fence, deposited it upside down on ground. Two other ships were completely untouched. (*J. S. Delaney, Jersey City, N. J.*)

Ticket Taker. Washington State patrolman spotted pilot doing acrobatics in reckless manner at low altitude over town. He drove to local airport, waited until Dilbert returned to field, then greeted him with a summons for reckless flying. (*W. Hutchinson, Washougal, Wash.*)

Ole Walnut Game. Pilot became lost on a cross-country flight, decided to make an emergency landing and find out where he was. Spotting large field he came down for perfect three-pointer in front of farmer's house, then discovered field across road was an operating airport. (*V. R. Smith, Abilene, Texas*)

Att'n Readers:

If you have any news note oddities pertaining to aviation, send them to SKYWAYS, Box 17, 444 Madison Avenue, New York 22, N. Y. Five dollars will be paid the sender of each "oddity" printed.. Contributions cannot be returned unless accompanied by stamped addressed envelope. The decision of the editors is final.

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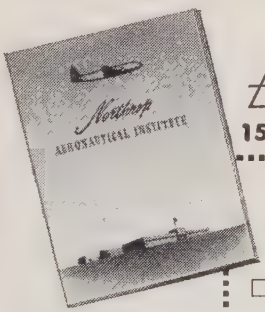

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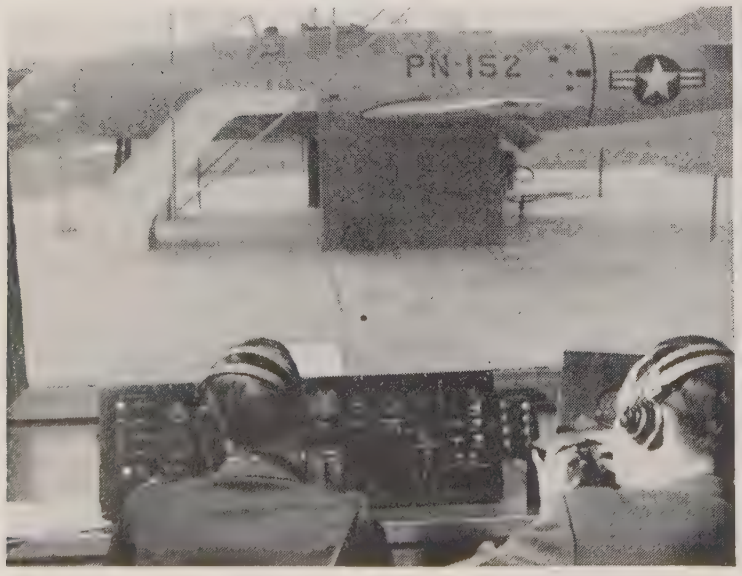
APPROVED FOR VETERANS

JET SCHOOL for AIRMEN

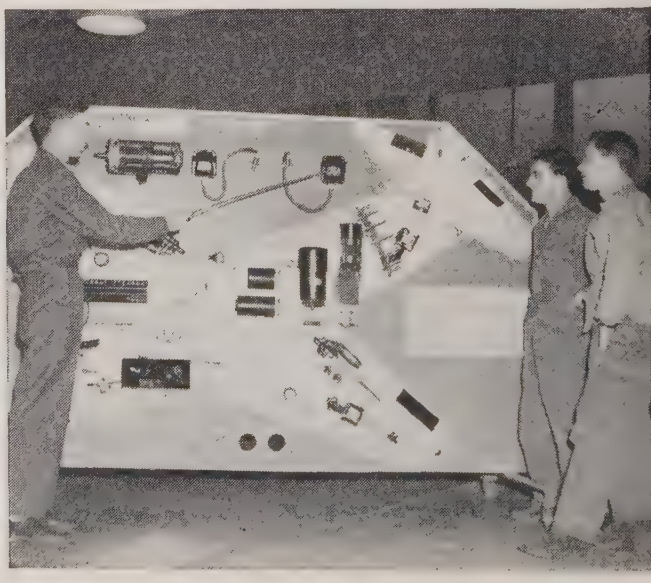
By JERRY LEICHTER

TRAINING PROGRAM for new Air Force calls for main emphasis on maintenance and operation of jet aircraft. Jet transition course is for rated fighter pilots; the specialization course is for cadets of training program

CAPTIVAIR gives flight trainees flying experience without their leaving ground. Instructors sit in control house



TECHNICAL personnel are trained at Chanute Field. Men are being shown components of jet electrical system



THERE are still many pilots who say that they fly by the seats of their pants. Unfortunately no one has invented a pair of trousers to help a man to think even half as fast as the speed of sound.

Only a few years ago the world's best pilots had to change their techniques to safely operate planes at over 300 mph. Today, the exercises alone for jet flight training are conducted in a speed range of from 350 to over 500 mph. Where a pilot once was taught to become part of his plane and to "think with" its every action, today no pilot will live for long flying the turbine jobs unless he can "think *ahead*" of his plane.

Flying training has had to be extended, modified, and in some cases, twisted by expediency to train the men who will constitute the new jet Air Force. As a corollary, the training for all inter-related jet activities, ground and air, has undergone drastic changes in ideas and action to gear the Air Force to new speed levels and radically new equipment.

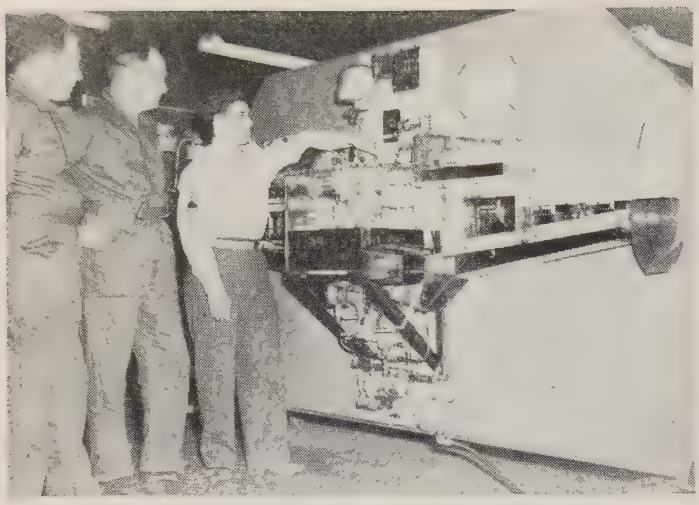
Actually, the fundamentals of aviation are as carefully taught with as much effectiveness and safety as during previous years, but accidentally or otherwise, the independence of the Air Force has been accompanied by freer methods than ever before used, mostly in the telescoping of flight training through aircraft speed ranges. Wartime cadets and technicians wouldn't recognize the "wild blue" schoolhouse of today's Air Force.

The USAF's Air Training Command, responsible for the mission of training, as individuals, all air crewmen and technicians, is currently operating four courses of instruction in the flying and maintenance of jet-propelled aircraft. Forced by the lag in new equipment to modify parts of its program, nevertheless, the teaching methods now used by the ATC, with few expected changes, are designed for the future.

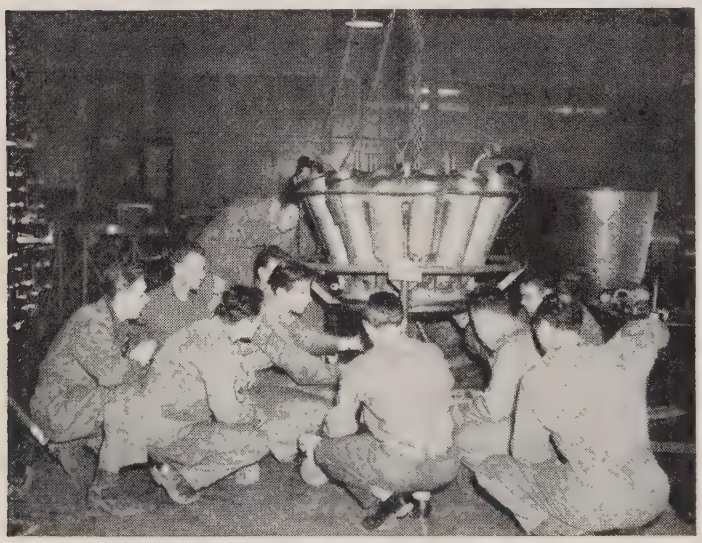
CREW CHIEF Sgt. C. F. Fletcher, graduate jet mechanic, looks after this F-80 at Williams AF Base in Arizona

Two of the courses are for pilots and are conducted at Williams Air Force Base, Chandler, Arizona, of the Flying Division, Air Training Command. One is a jet transition course for rated fighter pilots and the other is a jet specialization course within the aviation Cadet Pilot Training Program. As far as jet bomber training is con-

AVIATION CADETS in Advanced Single-engine phase of pilot training walk through a line-up of F-80's at Williams Air Force Base. Some of these men will learn to fly the F-80 or other jet ships before they win their wings



SECOND phase of mechanic training at Chanute calls for intensive instruction on jet plane airframes *(above)*. Program also includes practical work in power plant shop. Mechs here are dismantling a J-33 type jet engine



cerned, its future is linked to jet bomber production—still in the prototype stage.

The two courses for training technical personnel in jet-propulsion maintenance are at the Chanute Air Forces Base, Rantoul, Illinois, of the Technical Division, ATC, long the nucleus station of air force ground training activities. One is a basic course for airplane and engine mechanics and the other an advanced course for airplane power plant mechanics.

Williams Air Force Base— Jet Pilot Transition

The pilot transition course was the first of the training routines to be inaugurated, the first class beginning at Williams in July, 1946. Two basic problems had to be surmounted. The only operational jet fighter then in production was the single-place Lockheed F-80, precluding a vitally necessary dual-instruction flight phase. The other problem concerned the great jump in the speed range of the plane and the need for entirely new cockpit techniques in navigation and flight maneuvers.

The teaching methods evolved in conquering those problems have pointed the way for the present course that takes men from the Air Force reservoir of experienced piston-engine pilots and in five weeks turns out jet fighter pilots who need only the final polish of field service.

All students must hold a currently effective pilot rating and must have flown a minimum of 150 hours in fighter-type aircraft or have been graduated from the advanced single-engine fighter school within six months before entry. *(Continued on page 40)*

JET ENGINE inspection of an Air Force jet ship is a lot easier than inspection of a reciprocating engine. It took these airmen, at Williams Air Force Base, less than 10 minutes to get this far in the maintenance procedure

FORSGATE AIRPARK in New Jersey helped to turn a hobby into a business. Note runways cut through wheat

FORSGATE for FLYERS

By WILLIAM A. PRICE

FORSGATE Airpark came into being because there was once upon a time a millionaire with some eccentric — and expensive — ideas about hobbies.

When he died, back in 1931, he left in his wake a string of white elephants into which a million dollars had been sunk — with never a penny of profit. Included, were a 1,600-acre "model" farm on the rolling New Jersey countryside with its $355,000 golf couse and a combination country

VISITING PILOT in a *Super Cruiser* flies in for game of golf. Building in the background, left, is country club

JEEP greets visitor to Forsgate Airpark and leads him to the flight line via taxi strip cut through wheat

BAILER working in the wheat field stops to watch a plane taxi by. The farm is managed by founder's grandson

club-inn which is now probably the plushiest pilot's lounge in the business.

The old man's heirs have put these white elephants to work, and the result is Forsgate Airpark, strictly from a pilot's sweetest dreams.

Included in this airpark-to-beat-all-airparks is a three-strip landing area, with green sod runways, 2,400 to 3,000 feet long, cut through strips of yellow grain, full airport facilities including a shop, administration building, link trainer, and a snack bar on the flight line. At the end of the runways is the club house, complete with cocktail lounge, dining room, locker rooms, and immaculate overnight rooms with the most comfortable beds an airman ever slept in. Beyond, stretches a rolling 18-hole golf course, the pride of the late Charles Bank, famed golf course architect. And all these things at popular prices.

An added attraction is Sam Forgotson's Little Star Dude Ranch, Jersey-style, adjacent to Zeig Field, another airport designed to serve the flying sportsman, five minutes away and practically in the traffic pattern at Forsgate.

Many a pilot who's accustomed to dust, mud and dirt for his airports, gives a double-take when he spots Forsgate from the air. It's that unbelievable.

The place does beautifully in technicolor, especially during harvest season when rows of stacked wheat bundles form a corduroy pattern in the cultivated area between the "X" of the runways.

Ten miles south of New Brunswick, N. J., 12 miles east of Princeton, 40 miles from both New York City and Philadelphia and on a bee-line between them, Forsgate is worth that look-see from the air, even if you don't land.

After a view of the field, however, and the immaculate white farm buildings, the rambling club house and the rolling fairways and greens of the golf course, chances are you'll want to sit down. Maybe it will be for a scoop of fresh Forsgate ice cream at the Snack Bar on the field, ice cream famous in that part of Jersey, and *(Continued on page 43)*

AIRPORT MANAGER Albert Hunker greets *Cruiser's* pilot and his friend upon their arrival at Forsgate Airpark

FORSGATE Station Wagon delivers guests to country club. Eight-room guest houses are adjacent to the club house

EN ROUTE HOME in the late afternoon, pilot flies over Forsgate Airpark Country Club and its popular golf course

GOLF COURSE stretches beyond club house. Each hole of the course is replica of a famous green here or abroad

DINNER in the club's dining room that overlooks 18th green is fitting, pleasant climax to a day at Forsgate

NEW AERONCA SEDAN, on delivery flight to California, proved an excellent performer. Here author checks gas cap

Pilot's Report . . . AERONCA SEDAN

By CHASE CRAWFORD

CRUISING SPEED of the ship with a full load was a good 110 mph at 5,000 feet. Cabin was roomy and comfortable

(This is the second in a series of impartial pilot reports on new, four-place family airplanes. Next month, the Ryan NAVION.)

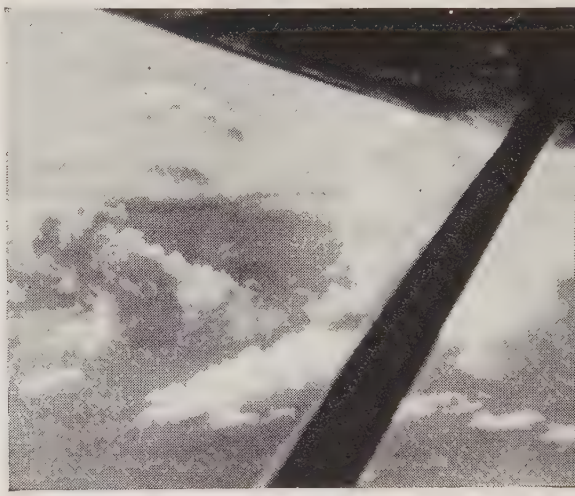
YOU LEARN a lot about any new plane on a cross-country ferry flight, and ours in the new Aeronca *Sedan* gave us fun along with the good hunk of learning.

The higher the country, the better the performance of this new Aeronca. Short-field take-offs and steady climb with full loads should make this plane popular, particularly those parts of the world that are covered with dark brown on airway maps.

For a report more complete than the story of half a dozen landings in a new plane, we picked up Aeronca's production model #13 at the Middletown, Ohio, factory and ferried it west to a Southern California dealer.

You'll never have any trouble in recognizing the Aeronca *Sedan*. That 37½-foot, all-metal wing stands out like a silver signboard. Sales Manager Floyd B. Simmen explained at the factory that the metal-skinned wing was designed as a money-saver for the owner. The wing has 80 per cent of the total area of the plane but is normally subjected to little or no damage other than natural deterioration. The fuselage, on the other hand, is usually the part of the airplane that is bent-up in hard landings and taxi accidents. With the *Sedan's* conventional steel-tube fuselage, even extensive damage can be *(Continued on page 50)*

INSTRUMENT PANEL on the *Sedan* is neat, well set up. Note its dual wheel



STORMY WEATHER dogged the *Sedan* from factory to L. A. Despite this, trip was fun. Photo *(below)* was taken from *Sedan* over Pecos River Canyon

AIRPORT people from Ohio to California welcomed the new Aeronca. At every field crowds of local pilots, business men and operators milled about the new ship, gave it nods of okay. At Cutter-Carr Airport in Albuquerque, N. M., a snow squall *(below)* hit ships just at take-off time

CONVAIR—240

CONSOLIDATED-VULTEE Aircraft Corporation has begun delivery of its new 40-passenger transports to the nation's airlines that have ordered them. These airlines include American Airlines, Western Air Lines and Pan American World Airways.

Powered by two Pratt & Whitney 2,400-hp engines which turn reversible-pitch props, the *Convair-Liner* has a gross weight of 39,500 pounds, a payload of 8,509 pounds. Top speed of the ship is 336 mph at 13,500 feet and its cruising speed at 16,000 feet is listed at 300 mph. Range of the new transport, with 10-mph head wind and full payload, is over 800 miles. The Convair 240 has a wing span of 91 feet 9 inches, is 74 feet 8 inches long, stands 26 feet 11 inches high.

The cabin of the ship is air conditioned, providing a change of cabin air every three and a half minutes.

CONVAIR-LINER close-up shot *(left)* shows its retractable flaps. Using full flaps, the 240 has a landing speed, with full load, of 100 mph. Convair's plant located in California makes possible outdoor assembly line

New transport to share airlines' short-haul honors with Martin 202

During cold-weather operations, radiant wall heating brings warm air up through the walls of the plane and into the cabin from the top. This is a distinct improvement over the old drafty methods so familiar to air travelers aboard prewar airliners.

Another improvement is an integral, self-contained stairway which eliminates the need for ground loading equipment. This built-in ramp is located in the side of the plane just forward of the wing in some cases, and in the rear under the tail in others, according to specific airline specifications. A self-service baggage rack is optional. This rack permits passengers to carry their own luggage on and off planes, another feature that will please airline travelers who've been among the few to have lost luggage or had to pay unnecessary tips to porter personnel at some terminals.

The Convair 240 will replace prewar DC-3's.

COCKPIT photo of the American Airlines' version of the 240 shows its complete and well-appointed instrumentation. American Airlines was first to take delivery of *Convair-Liners,* were put into scheduled operation in June

REAL ESTATE operator in Washington solved problem of showing island property by buying *Cruiser* on floats

Plane Sells Property . . .

By M. W. EXTON

VIA PLANE, dealer showed properties in an hour. Without an airplane, it would have taken him two days

WE HAD to have a plane. There was no argument about that. We had to have a seaplane, as anyone who has seen the San Juan Islands, off the coast of Washington, will understand. The bays are so numerous that no matter the direction of the wind, there is always a cove in the lee somewhere within easy reach of your destination.

Our business is real estate. In San Juan County that may—and often does—mean that you spend three or four days showing one person two or three properties. When you have a number of islands to cover, time is required, whether you have a complicated itinerary with ferries or you use your own boat.

With a plane we knew we could show in an hour the same properties we would show in a day or

COVES on San Juan Islands always provide a safe landing area no matter from what direction the wind blows

two without one. It would be a simple matter to fly a customer over all our listings and let him select from the air the ones he wanted to inspect more closely on the ground. From the air the prospective buyer could get more detail than in hours of tramping on foot. Most of our listings are on the waterfront, so hopping from one property to another would be a simple matter. But—our real estate business didn't run to a plane-buying sort of profit.

We agreed that we needed a seaplane, but how were we going to pay for it? Could we use it for charter? Could it possibly support itself? Where would we get a commercial pilot for a gamble like this? We had no idea how business would be, and all we could guarantee was a percentage of the take. Richard Exton, my husband and the head of our real estate business, couldn't divide his time between showing real estate and commercial flying, and do justice to either. Yes, we had a problem.

All fingers crossed, we finally asked John Spencer of Lopez Island, an experienced Navy pilot now farmer, whether he would abandon his cows to the mercies of a hired man for a few months, and see what happened. The hex worked and John said, "Okay."

After much inspecting, corresponding and consultation, we ordered a *(Continued on page 47)*

CRUISER had its horsepower upped to 115 and is now back in real estate operation after winter lay-off

Will the PROP DISAPPEAR?

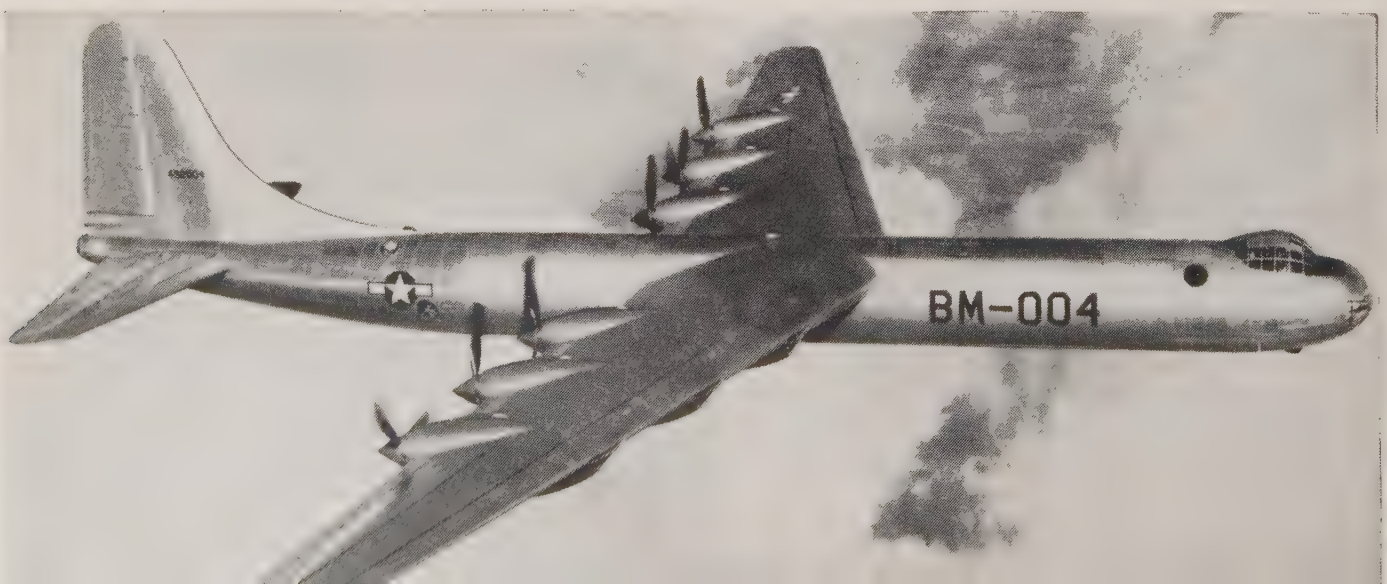
Despite development of jet propulsion, the prop still has major role to play

By VICTOR BOESEN

WHEN an early engineer invented the wheel and fitted a pair of them to a cart, it was boldly predicted by progressive thinkers of the day that the camel and the jackass as cargo carriers were through. A clamor of disagreement rolled from the caves. The tradition of controversy over something new in transportation laid down by this argument has its counterpart today in the discussion over jet propulsion versus propellers. Will the propeller go, or will it continue to have employment? The fact that the camel and the jackass are still in service, surviving each new step in the cavalcade of transportation, has not discouraged the prophets of displacement.

And perhaps they are right. But it won't be for a while yet. The "blowtorch" may get you there faster, as of now, but the propeller takes you

NAVY'S 180-passenger *Constitution (left)* swings four-bladed 19-foot props. Ship has speed of 303 mph. The six-engined B-36 *(below)* swings reverse-pitch props. It has speed of 300 mph and a range of 10,000 miles



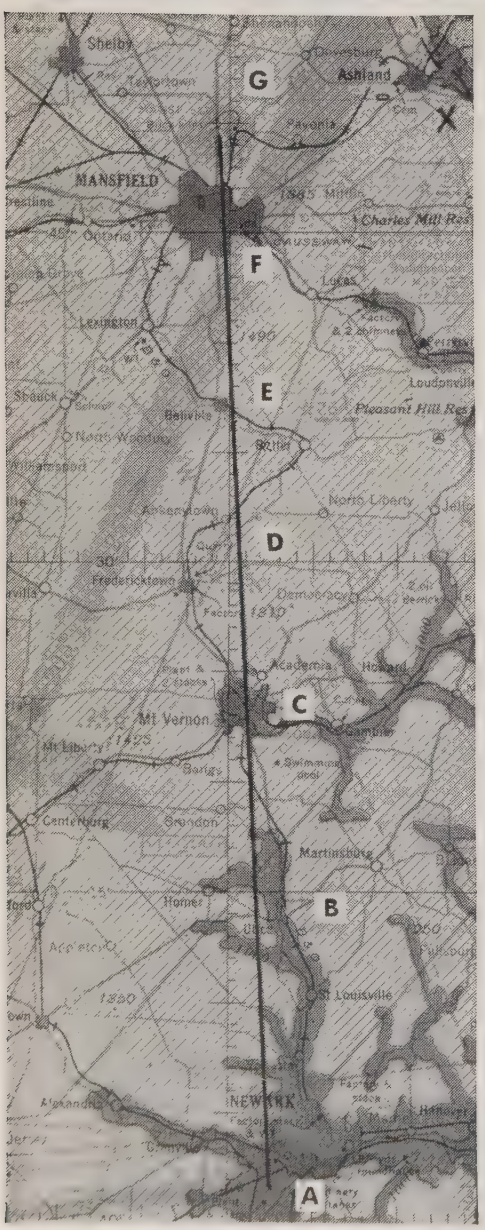
JET counterpart of the giant B-35 prop-driven bomber *(right)* is Northrop YB-49 *(above)*, an eight-jet bomber

farther and with a heavier load; and as long as this is the case the prop isn't going up to the Smithsonian Institute. Moreover, the propeller still hasn't gotten its full development. Just before the war, it was believed that 400 mph was about the best we would ever do with it. Today, however, Hamilton Standard is just one outfit that has developed props delivering 500 mph, and there are signs of 600 in the offing.

That makes the prop ship almost as fast as the present jet, while retaining the several advantages that distinguish it from *(Continued on page 41)*

INTERIM ship, between age of propeller and age of full jet, may be the turbo-prop. Navy version today is Ryan F2R-1, powered by two jet engines, one swinging a prop. This combines best features of both

FLIGHT by NIGHT



NIGHT FLIGHTS call for good preflight planning. Trip *(left)* was from Newark to Mansfield. Note check points at Utica, Mt. Vernon, Belleville, etc.

By JOE BONANNO

"WELL, how did I know it was going to be so different at night?" came the complaint at the after-flight bull session. "I've flown the route a half dozen times by day."

It was Al's first night flight, a short hour hop, but he lost himself. After floundering around for 15 minutes, he put in at the first field he spotted.

Another pilot put down his coke long enough to smile at the bewildered one.

"It isn't so different, Al," he told him. "In fact, it's quite a lot like day pilotage—only more so."

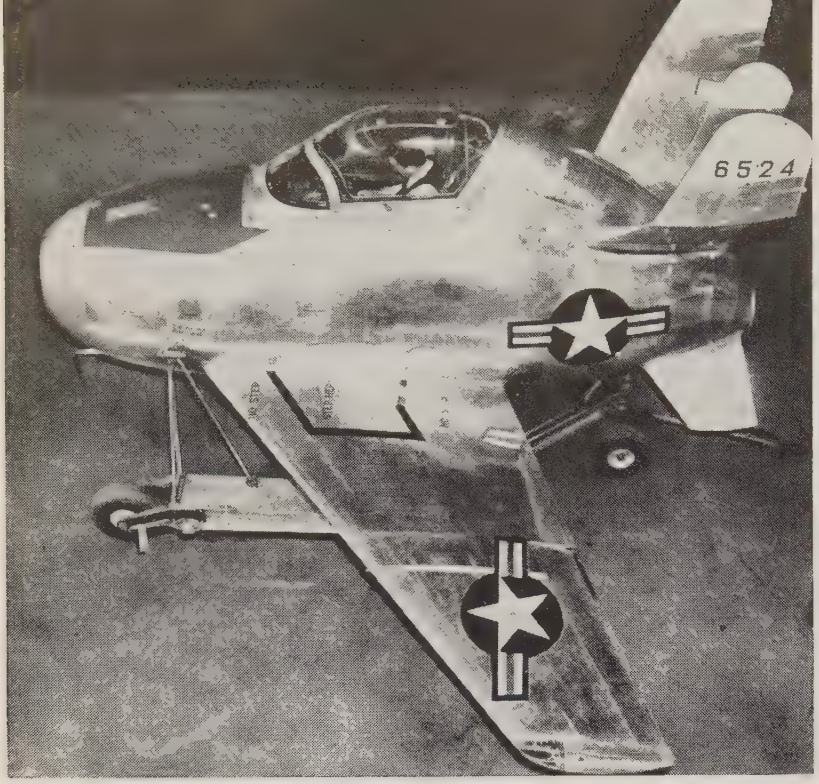
That's exactly what night-flying is . . . a lot like day pilotage—only more so. What he meant was this. Things aren't so radically different at night, but you have to *keep* at your job of navigating. A lot of hot pilots breeze through their day flights with a minimum of check points and get away with it. That kind of lackadaisical pilotage just doesn't go at night.

Night pilotage demands that you keep at it. Preflight work isn't just for the beginners on night flights—the old timers know the importance of pre-determined check points when flying at night. In short, slipshod pilotage will lose you pretty quick on those after-dark hops.

The bull session continued. What to look for at night? What *are* the differences from day pilotage? We broke the check points into two groups: those used day and night, such as cities and towns, rivers, railroads, highways, contours, wooded areas, etc., plus those check points expressly used as aids to night flying—beacons.

In the first group the problem is, of course, to know what will afford a good check point at night, and what will lose importance. Cities and towns, for example, remain good check points at night, but methods of identifying them are different. *(Continued on page 46)*

WATER, RAIL TRACKS, etc., reflect light on moonlight nights, so are reliable checks *if* you are on alert for them



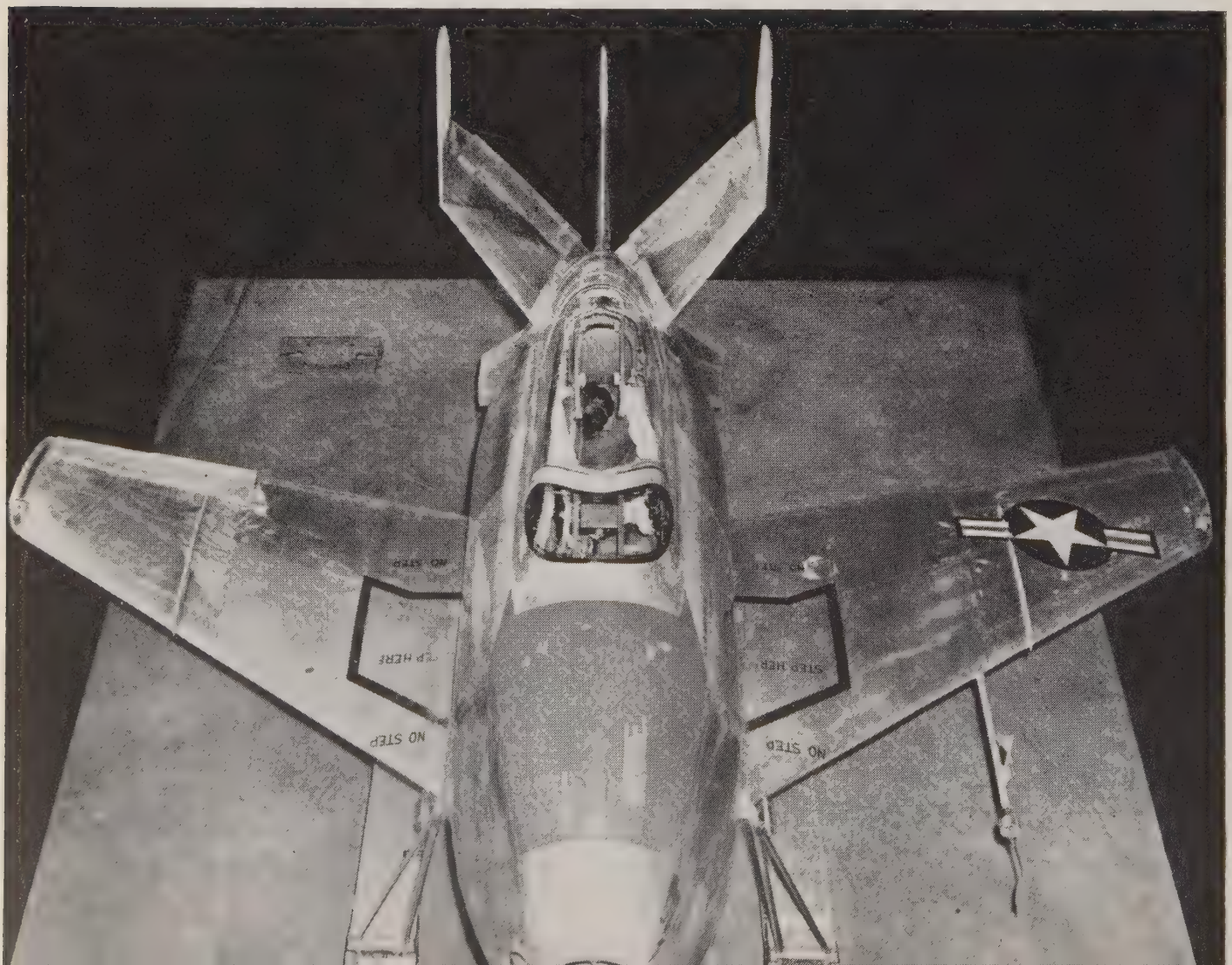
USAF'S XF-85 will undergo its first flight tests this summer. Jet fighter was designed to fit B-36 bomb bay

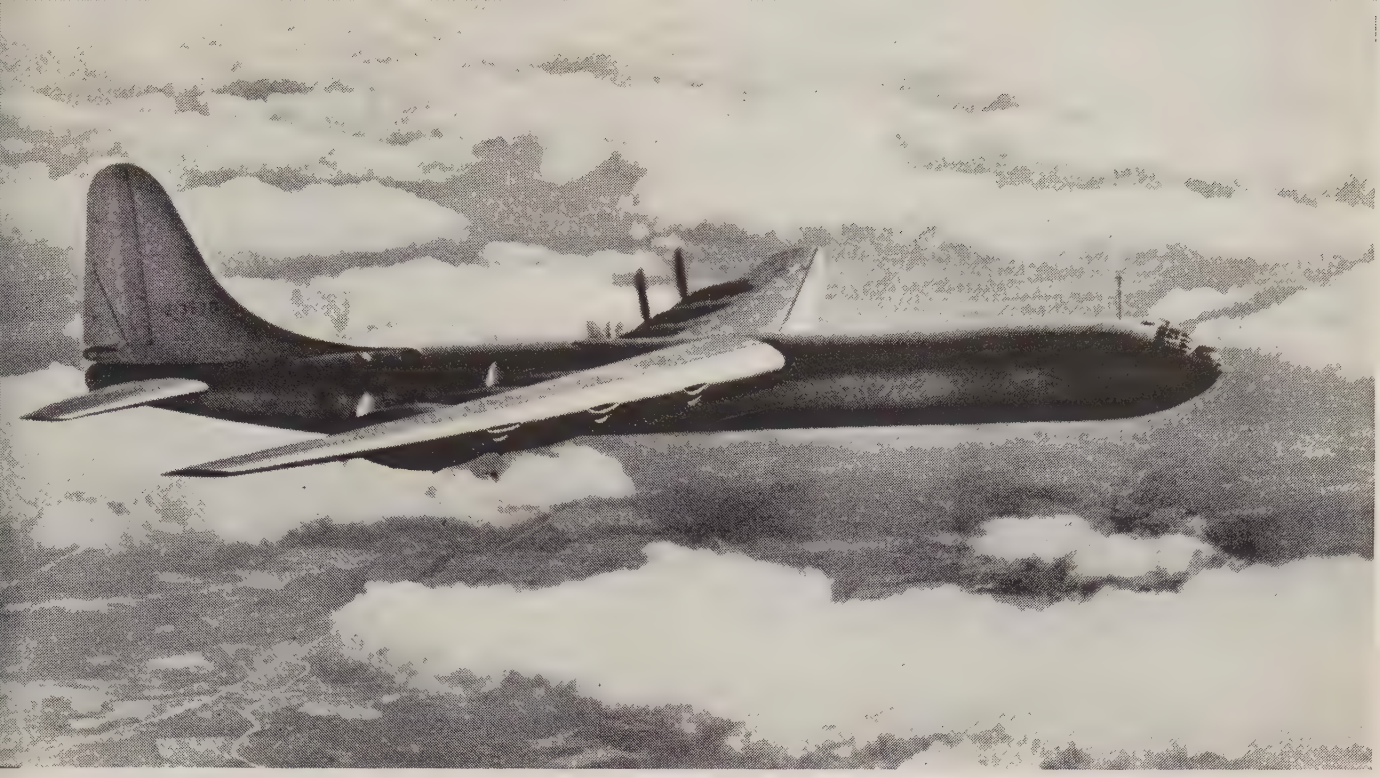
XF-85...

Parasite Fighter

Jet developed by McDonnell Aircraft to be carried by B-36, to take off and then land while in mid-air

TAIL of the XF-85, called "X" configuration, was designed to facilitate ship's stowage in B-36 and to provide maximum stability in flight. Hook which attaches plane to B-36 retracts into a flush-sealed compartment atop nose





AIR FORCE'S B-36 will be the parent ship of McDonnell's parasite jet fighter, XF-85. Powered by six Pratt & Whitney pusher-type engines, the B-36 has a reported range of 7,000 miles with a bomb load of 72,000 pounds

THE wraps recently were partially removed from the Air Force's XF-85, a jet parasite fighter built by McDonnell Aircraft, famed designers and builders of the Navy's *Phantom* and *Banshee*. The ship has no wheels or landing gear of its own, because it was designed to be based on a larger plane, to take off and "land" while in mid-air.

Although specifically intended to be launched from the bomb bay of the Consolidated Vultee B-36, the first flight tests of the XF-85 will be made from a modified B-29.

The XF-85 has a wing span of 21 feet and is but 15 feet long. Its length was limited to 15 feet because the bomb bay of the B-36 is only 16 feet long. Wings of the parasite fighter fold back so that it can be completely confined within the narrow space that is available. The unique arrangement of the tail, called "X" configuration, was developed so that the tail would not have to fold as well as the wings. All of the equipment that fits into a standard fighter plane had to be compressed to fit into the stubby fuselage of the XF-85. The ship then had to be fitted to a mechanism which would "hangar" and launch it as required.

The XF-85 will be refueled while stowed in the bomb bay of the parent plane. This jet fighter is powered by a single J-34 Westinghouse turbo-jet. Pilot will sit atop the engine in a pressurized cabin. He will wear a heated flying suit, a bail-out oxygen bottle and a high-speed parachute.

PHOTO of the World War II B-29 *Superfortress* alongside the B-36 gives some idea of the increase in size of bombers being developed today for the USAF. Wing tanks in B-36 hold enough fuel to drive car 16 times around world

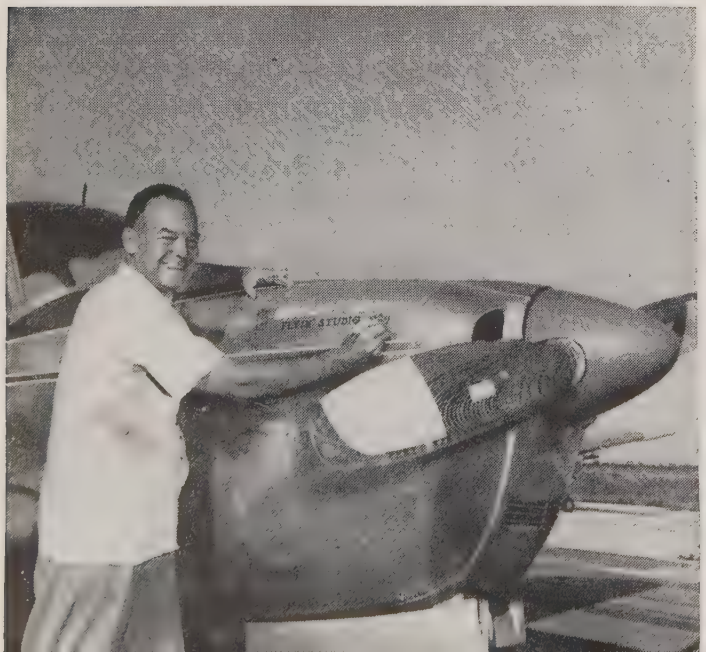
HOME BASE to Cartoonist-Pilot Zack Mosley is Stuart, Florida. One assistant is his brother *(left)* Robert

SMILIN' JACK

Airman Zack Mosley pleads for safe and sane flying via his Smilin' Jack

By ERNEST F. LYONS

"FLYIN' STUDIO" was the sign Zack painted on the nose of his new Beech *Bonanza* soon after it was delivered



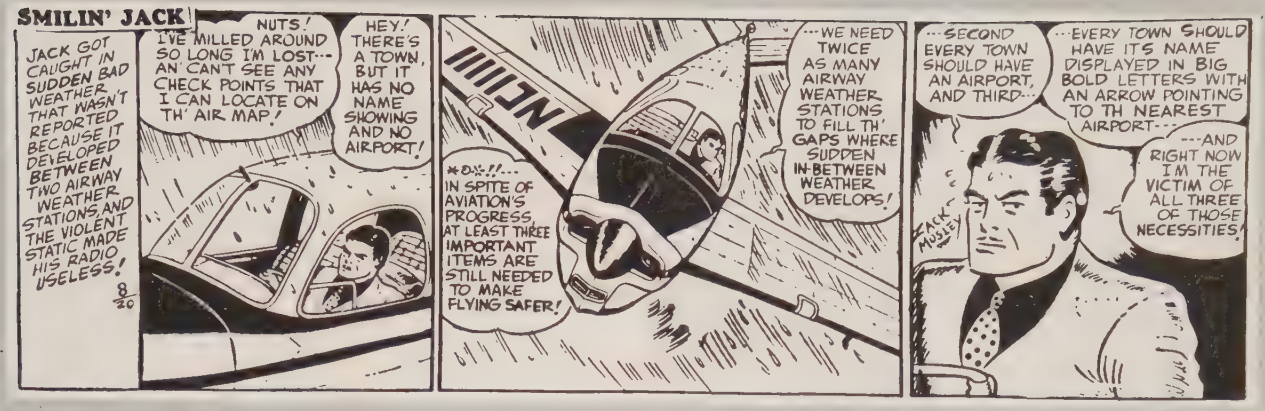
AN aviation comic strip is one of the most potent forces for air safety in America. Daily and Sundays its pilot hero and his pals dodge "enemy agents" and curvaceous sirens through a world of India ink—while spreading the message of safe and sane flying to an estimated readership of 50,000,000.

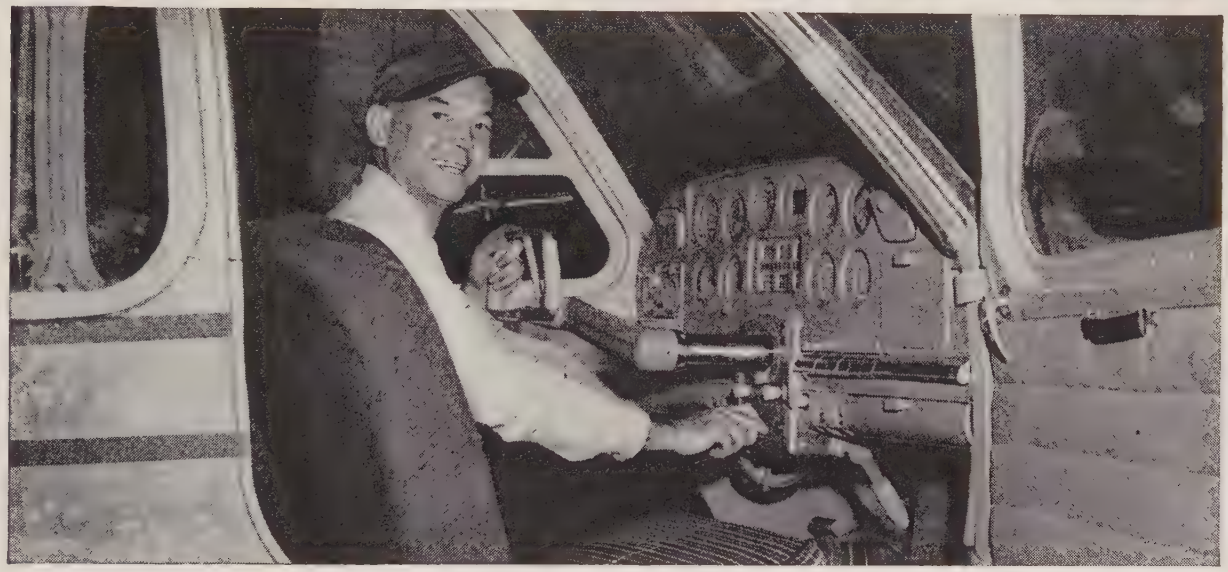
Not long ago "Smilin' Jack," who has had a thousand hairbreadth escapes (without losing a bristle of his dashing moustache) in the cartoon serial which bears his name, flew into soupy weather and lost his way. That proved it can happen to the best of 'em. Readers of 180 newspapers with a combined circulation of 18,000,000 figuratively bit their nails for two days until "Jack" found a railroad, followed it to a town and located an air-marker pointing to the nearest airport.

"Every town's air-marker is a monument to the pilots' lives that it may save," opined "Smilin' Jack."

Just words from the mouth of a cartoon character. Dream stuff. But they registered. A few days after the sequence appeared in its comic section, the Atlanta *Constitution* started an "Air-Mark Georgia" campaign backing up the CAA and CAP in placing standard air-markers at every one of the 500 cities, towns and rural communities on Georgia's aeronautical maps. An "airmada" of planes—exemplifying the theme "Air-Marking in Action"—streamed from Atlanta to Albany to install a sample standard roof marker.

In the lead was Zack Mosley, "Smilin' Jack's" creator, the "aviator's cartoonist," spearheading another drive for aviation. *(Continued on page 34)*


SMILIN' JACK
JACK GOT CAUGHT IN SUDDEN BAD WEATHER THAT WASN'T REPORTED BECAUSE IT DEVELOPED BETWEEN TWO AIRWAY WEATHER STATIONS AND THE VIOLENT STATIC MADE HIS RADIO USELESS!
8/20
NUTS! I'VE MILLED AROUND SO LONG I'M LOST--- AN' CAN'T SEE ANY CHECK POINTS THAT I CAN LOCATE ON TH' AIR MAP!
HEY! THERE'S A TOWN, BUT IT HAS NO NAME SHOWING AND NO AIRPORT!
NC
...WE NEED TWICE AS MANY AIRWAY WEATHER STATIONS TO FILL TH' GAPS WHERE SUDDEN IN-BETWEEN WEATHER DEVELOPS!
@%!!--- IN SPITE OF AVIATION'S PROGRESS, AT LEAST THREE IMPORTANT ITEMS ARE STILL NEEDED TO MAKE FLYING SAFER!
...SECOND EVERY TOWN SHOULD HAVE AN AIRPORT, AND THIRD---
...EVERY TOWN SHOULD HAVE ITS NAME DISPLAYED IN BIG BOLD LETTERS WITH AN ARROW POINTING TO TH NEAREST AIRPORT---
---AND RIGHT NOW I'M THE VICTIM OF ALL THREE OF THOSE NECESSITIES!
ZACK MOSLEY

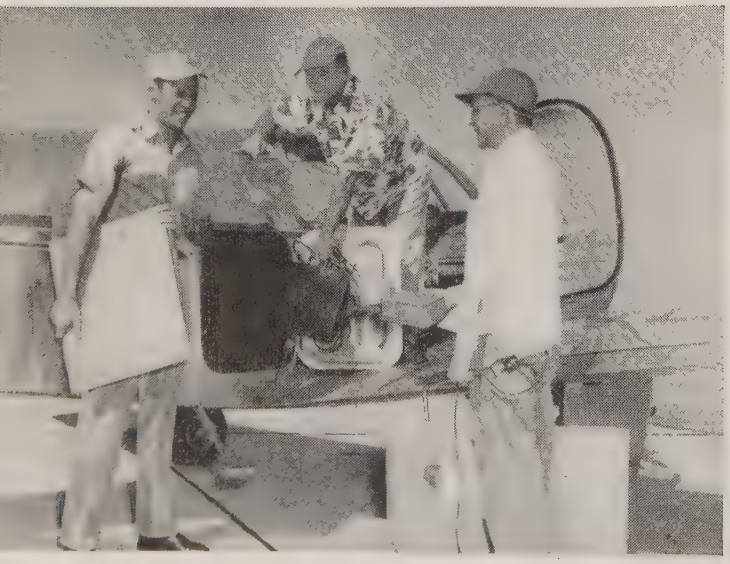


PILOTS throughout the country know Zack Mosley and his "Flyin' Studio," and 18,000,000 readers know his "Smilin' Jack" strip that beats the drum for good flying. One recent crusade called for nation-wide air marking

SMILIN' JACK
JACK GOT CAUGHT IN SUDDEN BAD WEATHER THAT DEVELOPED BETWEEN THE AIRWAY WEATHER STATIONS WHERE OTHER STATIONS ARE NEEDED!
8/21
NUTS! WHAT A SPOT--- ---GAS LOW--- RADIO IS DROWNED BY STATIC AND I'M LOST FROM DODGING STORM CENTERS AN' NOW I FIND A TOWN, BUT IT HAS NO AIRPORT OR EVEN A NAME DISPLAYED!
FINALLY JACK FINDS A RAILROAD--- FOLLOWS IT TO ANOTHER TOWN---
LOOK! A TOWN WITH LETTERS 20 FEET HIGH AND AN ARROW POINTING TO TH' NEAREST AIRPORT 26 MILES AWAY!
WAYNOKA
WOODWARD
26
JACK SOON LANDS AT WOODWARD, OKLA.
WAYNOKA'S AIR-MARKER SURE WAS A WELCOME SIGHT!
WE'VE A LOT OF AIR-MARKERS HERE IN THE MIDWEST. NEWSPAPERS IN TULSA AN' WICHITA LET PEOPLE KNOW HOW VITAL AIR SIGNS ARE!
ZACK MOSLEY
IN FACT, MANY PAPERS AND MAGAZINES AND TH' CAA ARE HELPING TO ESTABLISH AIR SIGNS!
---EVERY TOWN'S AIR-MARKER IS A MONUMENT TO TH' PILOTS LIVES THAT IT MAY SAVE!
WHEREAS THE SAME TOWN WITHOUT AN AIR-MARKER MAY BE A MONUMENT TO A DEAD PILOT!

CIVIL AIR PATROL officer during the war, Mosley is still at it. Here he helps CAP air-mark Albany, Ga.

AIR SHOWS and beauty contests in 28 cities in 14 states were on Zack's agenda last year. With him on most trips are his able assistants *(below)* Robert Mosley and Alec Delich *(at right)*. Drawing gear goes along, too



Zack Terrell Mosley is a mixture of humor and seriousness, modernity and prairie twang. He's a smiling young man who made an 8,000-mile flight last fall—with his studio and assistants in his "office on wings" — from Florida through the Southern States, across into Mexico, out to Los Angeles and back through his native Oklahoma to Florida "just to keep in touch with flyin' . . ."

"Smilin' Jack's Flyin' Studio," — a four-place Beechcraft *Bonanza,* distinctively numbered NC-11111, is apt to come cruising in at 172 mph to Cleveland, Denver, Chattanooga, or wherever the flivver planes swarm, and Army and Navy jets and supersonics thrill the nation's air-show enthusiasts. Chances are that some of the "hottest models" to be revealed at the shows already have been previewed in the cartoon serial. If not, they soon will be. The plane's number is so well-known in aviation circles that Zack Mosley, at the controls, is never surprised when a voice from the tower asks: "What's going to happen to 'Supersonic Sable?' " Or "Is 'The Head' really dead?"

There's a question whether this young man with the jaunty flying cap and Sooner State grin has ever really been surprised since the day in 1916 when a "wonder of wonders" occurred on the family ranch near Hickory, Oklahoma.

Zack was 10. He had just misspelled "cartoon" in the fourth grade, looked it up in the dictionary —and discovered that folks were actually paid cash money to draw the "funny papers." A sputtering Curtiss *Jenny* from Kelly Field made a forced landing on the ranch. Out stepped a begoggled, helmeted Army pilot, who has doubtlessly long forgotten the boy's eager efforts to draw his picture. It's a safe bet that the pilot was just plumb glad to be alive. That's one thing which hasn't changed in 32 years. But the boy never forgot. He went back to the country school and expanded that sketch into his first air-adventure serial.

"I called it 'Captain Henry in the Army,' " says Zack, whose big-time cartoon production today is distributed by the Chicago *Tribune*-New York *Daily News* Syndicate, Inc. "The circulation was one school notebook, which I still have."

As the "Flyin' Studio" circles in for a landing, it carries the staff and working tools of a serial so real to its readership that Mosley has been awed by public reaction. He gulped when university students held solemn funeral rites for "Joy Beaverduck." Remember? She perished as "The Coral Princess" in a South Pacific jungle. Somewhere her son, little "Jungle Jolly," is growing up. You'll see him again. Soldiers, dodging mortar fire in the foxholes of Italy, wrote in to plead for missed installments of the serial.

Everybody knows *(Continued on page 42)*

CHARTER chores of the taxi type even include a stop-off for ice cream

'COPTER ON CALL

Name the job and you'll find this outfit doing it

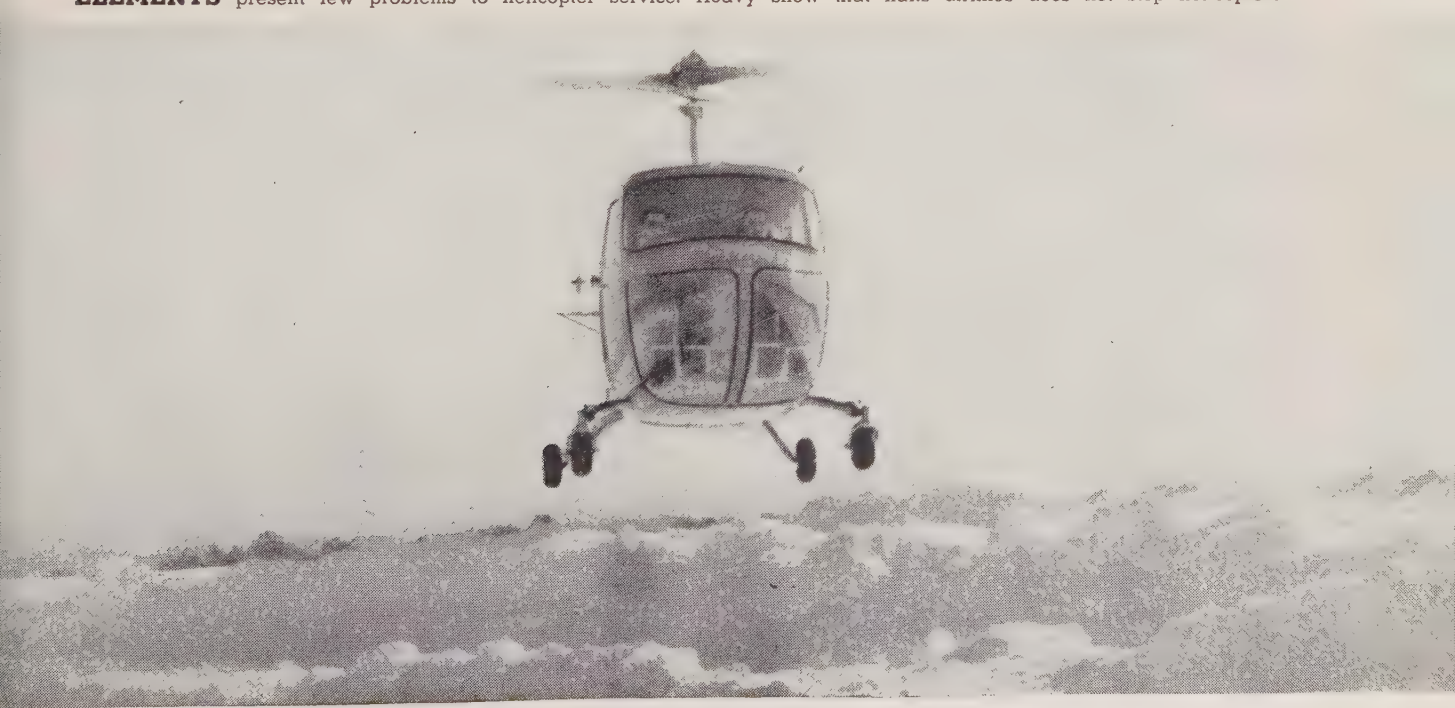
By GORDON GRAHAM

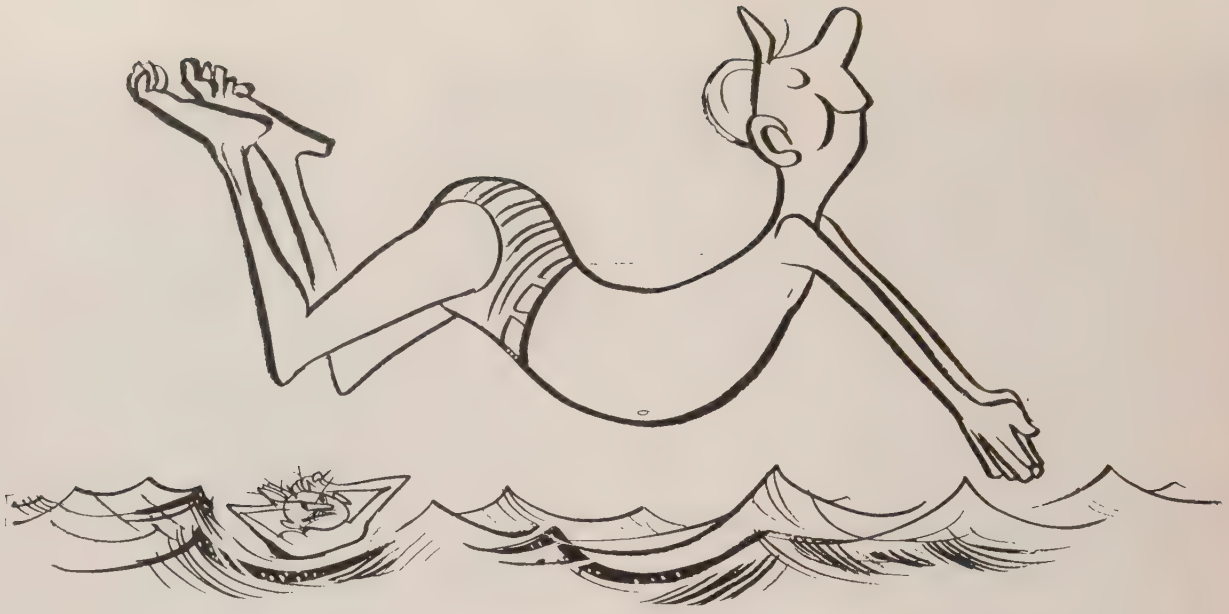
DELIVERY of "Rush" parts for an auto company is an assignment

SMALL-CRAFT warnings were flying at every weather station on the New England coast, heavy seas pounded the shore line, and even the great commercial airliners were grounded. It was on a day such as this that Lee Plympton, President of the New England Helicopter Service, Inc., received an urgent call to transport a young couple to the small island of Block Island situated in the Atlantic Ocean, 10 miles off the coast of Rhode Island, where an aged relative lay seriously ill. The island was completely isolated as no ship or airplane would be able to make the trip that day or possibly for a week.

Chief Pilot, William Prindle, formerly a Lieutenant Commander and Chief of Helicopter Operations for the U. S. Coast Guard during the war, assured Mr. Plympton that the job could be done with safety, and gladly *(Continued on page 44)*

ELEMENTS present few problems to helicopter service. Heavy snow that halts airlines does not stop helicopters

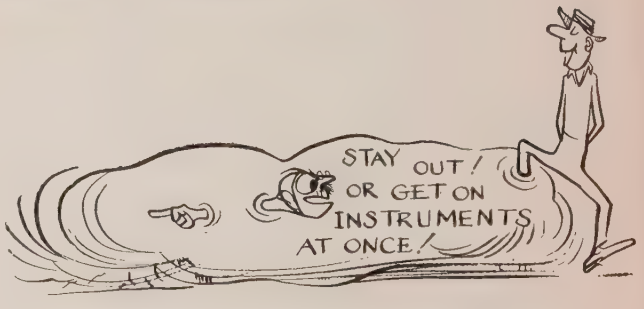




DILBERT

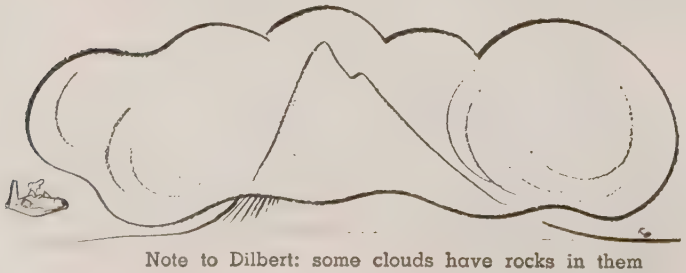
By S. H. Warner and Robert C. Osborn

Dis-Orientation — Very often, accidents which are mysteries to the general public, are crystal clear to pilots who read the Accident Investigation Reports of the Civil Aeronautics Board. All too frequently these reports end, *"Upon the basis of all available evidence, the Board concludes that the probable cause of this accident was the pilot's attempt to continue visual flight into instrument weather."* Don't let some such statement constitute your epitaph.



Dis-orientation crashes occur for various reasons. Many of them occur immediately after take-off when the horizon is obscured by darkness or overcast, and pilots are unable to go on instruments before striking the ground. Some occur during low-altitude maneuvers in instrument weather. Still others occur during flight in turbulent clouds, through confusion of lights, or in attempting let-downs in unfamiliar territory.

The following safety precautions are recommended to prevent or overcome the effects of dis-orientation, or vertigo as it is sometimes called. These warnings apply solely to qualified *instrument* pilots. If you aren't such, there is only one bit of advice which will do you any good; keep your dumb neck out of the soup until you are qualified.



Note to Dilbert: some clouds have rocks in them

a. On take-off, when the horizon is obscured by darkness or overcast, go on instruments immediately upon becoming airborne. Assume and maintain a safe rate of climb through instruments; do not make unnecessary turns, and do not operate any auxiliary controls until you are at least 500 feet above terrain. Leave your flaps alone, and don't unconsciously apply forward pressure on the stick while leaning over to operate some piece of equipment.

b. Never let down through the overcast until you have oriented yourself and are certain of the height of the terrain. If you are completely lost, it normally is wiser to bail out than to attempt a blind let-down. Some *(Continued on page 54)*

Portrait of a guy who's about to become a Hot Pilot

CAOA REPORT . . .

CORPORATION AIRCRAFT OWNERS ASSOCIATION, INC.

Corporation Aircraft Owners Association is a non-profit organization designed to promote the aviation interests of the member firms, to protect those interests from discriminatory legislation by Federal, State or Municipal agencies, to enable corporation aircraft owners to be represented as a united front in all matters where organized action is necessary, to bring about improvements in aircraft, equipment and service, and to further the cause of safety and economy of operation. The CAOA headquarters are located at 444 Madison Avenue, New York 22, N. Y.

Crosswind Gear . . .

The Aviation Departments of the member corporations of CAOA will want to watch closely the development of crosswind landing gear. The recent demonstration at National Airport, Washington, D. C., proved the practicality of the castering gear for executive-type ships in the twin-Beech or DC-3 class.

Goodyear Aircraft, CAOA member, developed one type of gear for the DC-3, and All American Aviation, Inc., developed a castering gear for the twin-Beech.

Test pilots from both companies were high in their praise of the crosswind gear, and both maintain the success of the gear will do much to improve the operation and utility value of commercial transports and executive aircraft.

The CAA thinks well enough of this gear to indicate possible revisions in the 1949 airport program, revisions to permit the construction of many one-runway airstrips.

Company-owned Aircraft . . .

The value of company-owned aircraft is a clearly . . . and impressively . . . told story contained in a brochure entitled, "The Air Fleet of American Business," put out by the Beech Aircraft Corporation, Wichita, Kansas. This brochure includes the answers to questions as to "how, why, and where" American business and professional men and women use company-owned aircraft in the furtherance of good business. For proof of the profit in executive aircraft ownership get a copy of "The Air Fleet of American Business" from Beech Aircraft.

Tech. Report . . .

Studies recently concluded by the Air Materiel Command to demonstrate that a pilot can recover to straight-and-level flight faster under contact conditions than he can under instrument conditions have now been published in report form. Designated as PB-81437, Pilot Reaction Time, the report is available from the Office of Technical Services, Dept. of Commerce, Washington 25, D. C.

CAB Amendment . . .

The CAB has amended Civil Air Regulation, Section 61.7804 which required the first or second pilot of an aircraft to use radio headset while in flight, or while taxiing. The amendment which went into operation the first of last month (May) now permits the use of a cockpit loudspeaker installation instead of the conventional, up until now, radio telephone headset.

New Exec. Ship . . .

A new executive transport, designed to interest companies and corporations operating their own aircraft for business transportation, has just been introduced to the public and given its first flight. Both the introduction party and the first flight were extremely successful. Called the Aero *Commander,* this seven-passenger transport is powered by two 200-hp Lycoming engines. In a report to CAOA, designer of the ship and president of Aero Design and Engineering Co., T. R. Smith, stated that the ship made a 600-foot take-off in just eight seconds on that first flight, and then climbed at a rate of 1800 feet per minute. Landing speed of the new Aero *Commander* was 56 mph. The ship has a designed top speed of about 210 mph.

One feature of the *Commander* is an interior cabin design which permits the ship to be transformed to a cargo plane in just a few minutes and with but a few motions. Mr. Smith also reported he hopes to be able to put the new *Commander* on the market for a price somewhere between $20,000 and $25,000.

News Notes . . .

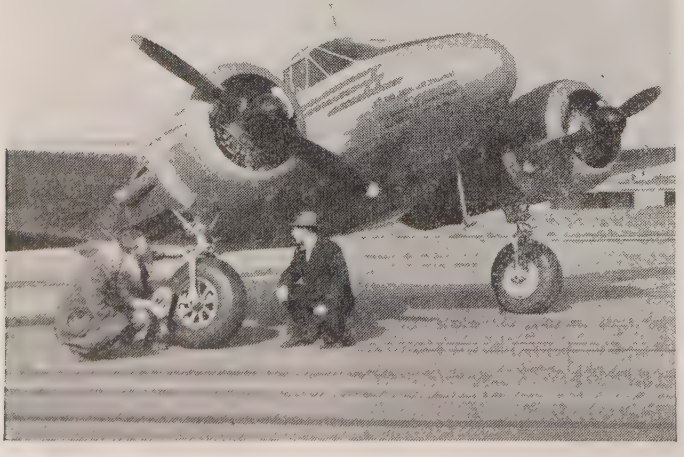
The Bristoliner, a twin-Beech owned and operated by the Bristol-Myers Corporation, of Hillside, N. J., recently returned from an executive trip to California, Oregon and Washington, Executive passengers flown by CAOA-Bristol-Myers' pilot Stan Bloyer were Joseph P. Hardie, Palmer J. Lathrop, and Elmer Robson of Rubberset Co., a subsidiary of Bristol-Myers. Co-pilot on the trip was William R. Martin.

Walter C. Pague, Chief Pilot for Armco Steel Corporation, flew his companies Beech *Bonanza* over the flood waters in the Cincinnati area so that radio personnel of Station WPFB, Middletown, Ohio, could make an on-the-scene wire-recorded report of the devastation caused by the flood.

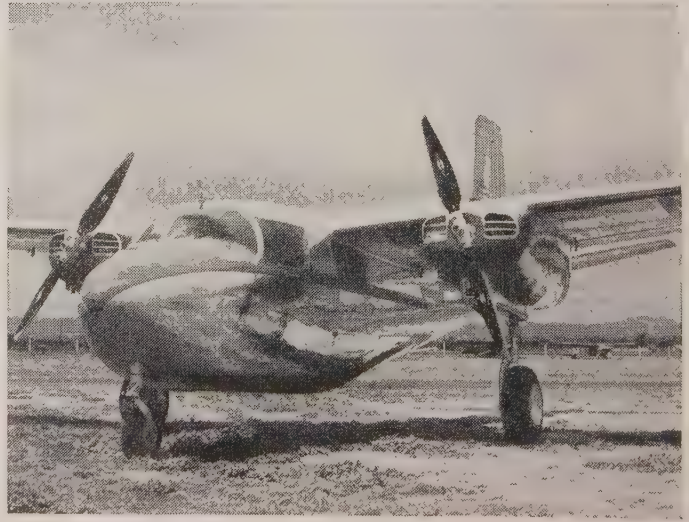
Insurance rates are going up, according to a report from Jerome Lederer of the Flight Safety Foundation. Reasons for the rising insurance costs, said Mr. Lederer, are increased cost of repairs, higher court claim verdicts, higher medical expenses, and inability of the nation to provide physical protection for the current large number of aircraft.

Head of the Mexican baseball league, Jorge Pasquel, is reported to have purchased a DC-6 and a Convair-Liner for his own personal use. The Convair-Liner is said to be having an executive-type interior installed by Grand Central Airport Co., Glendale, California.

CAA OFFICIALS look over the crosswind landing gear installation on a Beechcraft owned by All American Aviation, Inc.

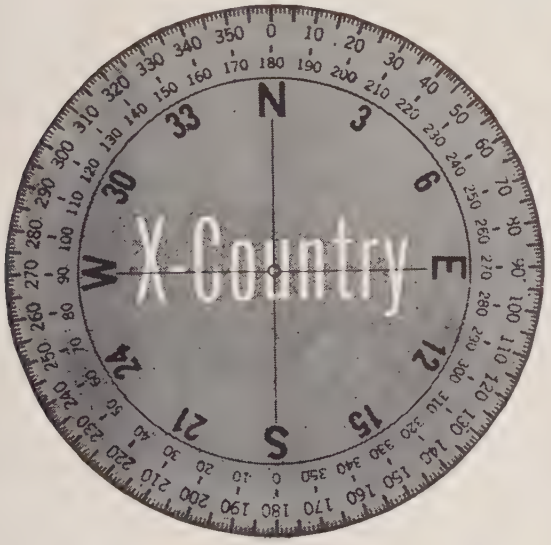


NEW EXEC transport is this twin-engine Aero *Commander*. A seven-place ship, it cruises at 165 mph, sells for $20,000



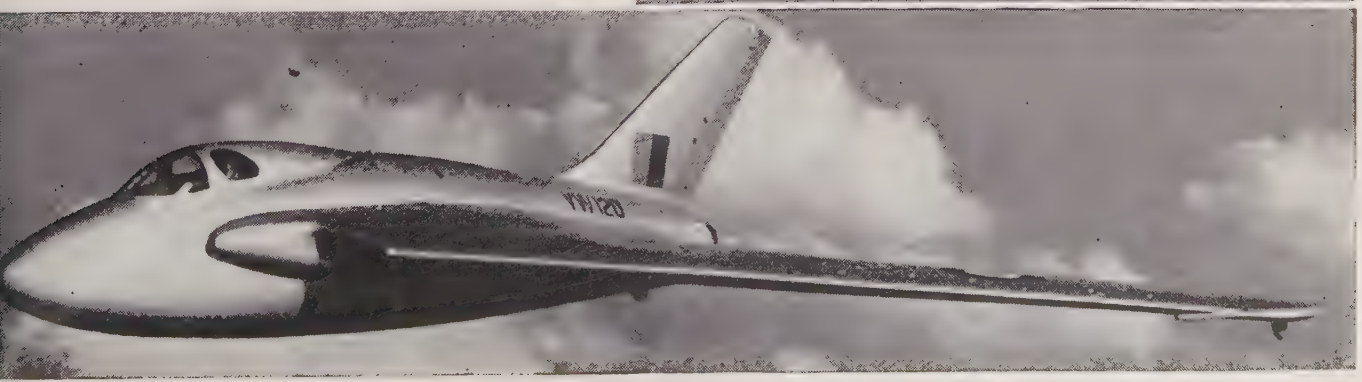
VICKERS SUPERMARINE *Attacker* recently flew a 100-kilometer closed circuit "race" at an average speed of 564.881 mph. Deck tests aboard the HMS *Illustrious*, large British carrier, proved the *Attacker* to be an excellent fighter for carrier operations

HANDY SHIP to have around is the Army Field Forces' new liaison plane, the Boeing *Scout*. It is shown here being loaded aboard a C-97. A five-man crew can dismantle the *Scout* and load it into a cargo plane, or remove and assemble it, in under an hour



TRACK-TYPE LANDING GEAR, developed by Firestone and demonstrated on Fairchild C-82, is called "Flying Runway." This gear distributes plane's weight over greater runway surface, thus enabling our largest aircraft to land on present runways at fields

DE HAVILLAND'S D.H. 108, a tailless research jet ship, set a new record for 100-kilometer closed circuit flying by averaging more than 605 mph. It is powered by a Goblin turbo-jet engine. Test pilot for the record run was De Havilland's John Derry



Jet School

(Continued from page 16)

The applicant must have flown a minimum of 10 hours in fighter-type aircraft or single-engine aircraft of 650 horsepower or more, including the AT-6, within one month of the date of entry.

The five-week course covers engineering, maintenance and armament features of the F-80; the theory of high-speed flight and related academic and military subjects. If an applicant qualifies for entrance he may become one in the normal enrollment of 36 pilots entering every five weeks. Planned on a dynamic basis, the instruction keeps pace with current stages of jet development and, since the beginning of the course, Williams has trained Navy and National Guard pilots and one CAA pilot in addition to Air Force men.

The rated speed of the F-80 (and all new operational jets) is well over 500 mph, which complicates standard flying training. High-speed turns, for example, require a far greater radius than in slower conventional aircraft. The "think ahead" training is vital in the operation of the one engine control in the cockpit—the throttle—since one of the characteristics of jet propulsion is the time lag between a change in the power setting and the resultant increase or decrease in thrust. Dual flight instruction would greatly simplify getting the importance of proper operation across to the jet newcomer.

During the later stages of wartime training, the drive to eliminate accidents in the accelerated program resulted in the use of a "Captivair," a fully equipped airplane mounted on concrete blocks, in which a pilot could be instructed in simulated flight conditions without leaving the ground. The dual instruction problem at Williams led logically to the setting up of a Captivair F-80 that was, and is, used to provide preparatory instruction for the first solo jet flight.

The Captivair F-80's jet engine and all controls operate normally and landing gear and flaps may be lowered or retracted. Each student studies the procedures for the F-80 in class and then puts his lessons into practice in "flying" on the ground. An instructor, seated in an adjacent control house, is in telephonic communication with the student and may simulate any flight condition by remotely varying instrument readings in the Captivair. Thus all the elements of dual flight instruction are duplicated as naturally as possible, along with some that might be highly dangerous in actual flight, except for the missing ingredient of gravity.

The recent development of the two-place tandem jet trainer, the Lockheed TF-80C, will speed up flight instruction phases and cut training costs considerably. Here again, wartime lessons in converting tactical planes into trainers which effectively duplicated the performance of first-line planes showed the way.

The TF-80C is powered by an Allison 400 turbo-jet of over 4,500 pounds thrust that gives the bigger plane substantially the same performance as the F-80. The wing span is the same for both craft, but the trainer's fuselage has been extended three feet, two inches, and a seven-foot bubble canopy has been designed to cover both cockpits. A larger air conditioning and refrigerating system had to be installed to serve the two cockpits. While all basic controls are dual, electric control cut-outs allow the instructor to take over at any time in flight. The TF-80C is completely equipped for flight, gunnery (including rockets) and navigation training, and may be adapted for other training uses.

Following the present classroom and Captivair training, the jet transition course student receives approximately 30 hours of flight time in standard F-80's. (The future role of the dual trainer had not been evaluated up to June.) Flight instruction is devoted to flying characteristics and familiarization, engineering, navigation, formation flying and altitude indoctrination. Air training exercises are conducted from a minimum of 350 mph to 550 plus, while altitude levels start at 10,000 feet and range up to 30,000 feet.

Navigation flights are made to San Bernardino, Calif., El Paso, Texas, and Albuquerque, N. M., to familiarize the student with problems to be encountered in high-speed, high-altitude navigation. Formation flying develops that necessary quality of thinking ahead of the engine lag and high-speed turn characteristics of jet aircraft, a factor combination that can be harder to impress on the experienced fighter pilot than on the new cadet trainee whose habits are not as fixed.

The success of and the lessons that came out of the jet transition course paved the way for the type of instruction necessary for including jet training in the aviation cadet course. Elimination of training problems and of possible errors in instruction technique have enabled Williams' instructors to treat the jet as "just another airplane," although the turbojets are "hot" jobs in more ways than one.

Even before jet training was incorporated into it on a limited basis the Aviation Cadet Pilot Training Program had been changed considerably. One basic pilot training phase, of eight months duration, was instituted in place of the old primary and basic training phases. With the advanced phase fixed at four months, the full course now is carried to one year as against the nine months of training during the war.

But the greatest change in the postwar program involved the aircraft used which demonstrated the turn-over in training methods. The wartime advanced trainer, the AT-6, was adopted as standard equipment for the entire basic phase while the P-51, and on a limited scale the F-80, because the advanced phase trainer. Thus the student, instead of being led slowly through the complications of flight, jumped from zero to 200 mph to 400 mph and then possibly to 500 mph.

The AT-6 brings the student into immediate contact with the problems and flying techniques applicable to service types since it duplicates on a minor scale much of the equipment found in first-line piston engine-powered planes. The same method of eliminating intermediary planes applies to advanced multi-engined training where cadets now use B-25's as advanced training planes.

Six aviation cadets of the small 25-man class begun at Williams in November, 1947, became the first cadets to receive jet training before their graduation in February, 1948. The pattern of instruction used for them, developed out of the lessons of the transition course, has been standardized for future cadet classes.

At present only a part of each advanced fighter phase class will be trained in jets. Whether the fighter pilot trainee is to fly piston engine or jet he goes through the P-51 training at Williams under present schedules. In case of stepped-up service requirements an entire class could be switched to complete jet transition. The current class of July 1, 1948, includes about 50 jet trainees.

The class schedule calls for 50 to 55 hours of flight instruction for all students in P-51's after basic-to-advanced transition training in a Captivair F-80 which conditions the

(Continued on page 48)

SKYWAYS

"That's funny . . . he speaks English!"

LAMB

Will Prop Disappear

(Continued from page 27)

the newcomer. One of these is the superior efficiency of the propeller. Since nature has a law that for every action there is an equal and opposite reaction, the object of any aircraft propulsive device is to hurl the air backward, much as a swimmer pushes the water to the rear. The faster and more voluminous it performs this function, the greater the reaction thrust forward. A B-29 propeller, running full out on the ground, displaces 25,700 cubic feet of air per second. A jet engine, addressing the air with only a small vent, as contrasted with the wide-swinging arc of the B-29 prop, is to it as a straw to a sewer main.

This means that the prop ship gets off the ground faster, which means a smaller field to operate from. It also means a bigger load, and a more efficient return on the fuel, not only during take-off but all through the flight. Under ideal conditions, a jet plane, flying 500 mph, uses .8 pounds of fuel per horsepower per hour. A propeller plane with a reciprocating engine, traveling the same speed, burns only .42 pounds per horsepower per hour, or about half that of the jet.

Another advantage of the propeller is its adjustability. Set it for big bites of air, up to 45 degrees, to get off the ground; pull it back to a flatter angle, saving power and therefore fuel, once you're underway. It's a little like shifting gears in an automobile according to your needs. The jet engine knows only one speed, and that's high, like a race car.

Furthermore, by reversing the pitch, the prop serves as a brake, a handy gadget to have upon landing. Northrop's B-35 *Flying Wing* bomber, a mastodon of 100 tons, is thus able to roll up a 110-mph taxi speed and stop dead, all within a 5,000-foot runway.

The propeller makes possible warplanes with 25 to 30 tactical uses, ships like the Douglas *Skyraider*, successor to its old *Dauntless* dive bomber, which hauls three tons of bombs, mines, torpedoes, and a bandolier of rockets under each wing, not to mention batteries of 20-mm cannon . . . all this from the short decks of carriers. With but an exception or two, a jet carrier plane needs a catapult to get off empty.

Those are the high points of the case for propellers. There is also a good case for jet, even at this early stage of its development. In fact, it is not reckless to say that pure jet propulsion, judging from the phenomenal progress of the jet engine in the short years of its existence, may some day overcome the disadvantages which, apart from superior speed, give it unfavorable comparison with propellers.

It was less than a decade ago that the jet engine, evolved from the lessons of General Electric's supercharger, made its appearance. By mid-war, it was already far enough along to hitch to a combat airplane, in competition with engines with a 50-year start; and now it powers the world's mightiest bomber: Northrop's YB-49, which, with eight jets, weighs 100 tons and carries 30,000 pounds of bombs. That precocious rate

(Continued on page 53)

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Smilin' Jack

(Continued from page 34)

"Smilin' Jack." Is there an American father who has not winced when his young hopeful puts on a living room demonstration?

"Ratta-tatta-tat!"

"Junior, you'll be late for Sunday school. Hand the funnies to Pop."

Breathes there a male reader with eyes so dull that they have failed to brighten—maybe not gleam, just brighten — at the streamlining of "Supersonic Sable," "Miss Guided Missile," or jet-propelled "Jato?" Who hasn't chuckled at "Fat Stuff and the Little Stuffs," so eagerly accompanied by dexterous chickens who catch popped shirt buttons in mid-air? Stenos throughout the land are said to sigh at the profile of "Downwind Jackson," airways Romeo, whose full face has never been seen, not even by Zack—honest!

And America has claimed as its own a descriptive phrase coined in the strip to describe alluring femininity. Without getting too technical about it, the term "Li'l De-Icer" describes that same radiant American beauty which used to cause Grandpa to push back his derby and quip, "I love my wife but . . . oh, you kid!"

Because he talks their language, is the only licensed pilot drawing an air cartoon strip, knows flying from the bottom up, is painstakingly accurate in technical details, roots for 'em and plugs for 'em, Zack has developed a following of untold thousands of flying fans. His friends are legion. No air show is complete without him.

"The strip belongs to American aviation—not just to me . . ."

He runs it that way. Notices on drawings or in opportunely found white space adroitly publicize air shows, air races, and air rodeos. Last year he received 280 requests to "plug" aviation events.

"I'm sorry we couldn't publicize *all* of them. Our daily strips must be done five weeks in advance and the Sunday pages nine weeks ahead. But we *did* manage," he says apologetically, "to mention 150 air meets last year in every State in the Union, Canada, Mexico and Central America."

He and his "cartoonin' crew" in the same 12 months flew to and made personal appearances at air shows and beauty contests in 28 cities in 14 states. Zack regards air shows as good business above and beyond the natural camaraderie of meeting his flying friends. At them he is either master of ceremonies, guest of honor—or beauty contest judge. This latter he regards as the hardest sort of work "in line of duty."

"We have to keep up with everything new in aviation," he drawls. Yet, when distracting new "Li'l De-Icers" appear in subsequent cartoons, and he is reminded that they appear progressively more streamlined without sacrificing any of the structural details which made those of Grandpa's day so popular, he admits: "The basic design stays the same as it was back there in Oklahoma."

He's a typical American, who picked cotton, delivered groceries, and jerked sodas. "Once," he says, "I tried to sell foldin' bathtubs but the ladies laughed at my demonstrations—and never bought a one."

Cartooning didn't come easy. Zack's a perfectionist. Sometimes today he pencils and rewrites a strip over two or three times before he's satisfied. He studied art in high school at Shawnee, Oklahoma, then went to Chicago, where he became acquainted with Carey Orr, famed editorial cartoonist for the Chicago *Tribune*. Working in restaurants by night to pay his way, he studied privately under Orr, attended classes at Chicago Academy of Fine Arts and the Chicago Art Institute. In 1929 he got a job as assistant to a cartoonist who was also a pilot. He began taking flying lessons, and in 1933 flew to New York to submit to Captain Joe Patterson of the New York *Daily News* the cartoon idea which later became "Smilin' Jack."

"Luckily, it appealed to him," Zack notes, with typical understatement.

"I kept on taking flying lessons at Roosevelt Field, received my private pilot's license on Friday the 13th, and that same day took up as my first passenger the only person I could find who had full confidence in me—my mother."

Since then he has owned seven planes: an Aeronca C-3, Piper *Cub Coupe*, Rearwin *Cloudster*, Stinson *Reliant*, Stinson *Voyager*, and the Beechcraft. He is the intimate of aircraft manufacturers who let him take

"first peep" at new productions. True to the craft, Zack never "crashes" an identifiable model. If you see some weird and unrecognizable crate in "Flying' Jack," chances are it's one of his own design destined for dramatic doom—without hurting aviation.

He works in close liaison with Army and Navy. When "Smilin' Jack" drops a supersonic ship from the belly of a B-29, pursues the villain with a radio-controlled super-duper, or employs other such highly technical stuff in this jittery era, you can bet every prairie dog in Oklahoma that national security is not in jeopardy. Just the opposite. In a recent sequence the cartoon hero was a test pilot on supersonic ships at Muroc Dry Lake, where he was pursued by a spy ring based at an imaginary resort hotel. At least it was imaginary to Zack—"I just assumed there ought to be resort hotels in that part of California." There were—and complete security has since been clamped down on spy-conscious Muroc Dry Lake.

"Of course, we don't really draw the cartoons in 'The Flyin' Studio'," Zack admits, "but we do carry all our gear in its roomy baggage compartment—drawing boards, special lights, a pencil sharpener, etc. We take notes on plots and dialogue while flying, and are ready to get to work in a hotel room 30 minutes after we land."

Zack is campaignin_ now against instrument flying "by anyone except skilled pilots, with co-pilots present—and both brushed-up to the minute on refresher instruction." In the strip the siren "Jato" tempts "Stretch" to fly on instruments through a storm but he turns the ship for a clear area, angrily replying:

"Listen, Jato, I'm playing it safe! When I'm flying a single-engine plane without dual radio and proper de-icing equipment —and haven't been continually practicing instrument flying, there's only one answer: *If* I went on instruments, I'd have to say to myself, 'this might be suicide for me and murder for my friends within a few minutes.'"

When "Smilin' Zack"—it's a natural sobriquet—and his crew set up shop in a hotel, first call is to room service for coffee and a snack. Sole purpose is to secure a table knife to loosen a couple of screws with which to affix the pencil sharpener. This "substitute screwdriver" incident occurred once, has since become a zany ritual—appreciated, perhaps, only by cartoonists.

Zack Mosley's year 'round residence is his modern Spanish colonial home at Stuart, Florida, where he and two assistants work furiously three or four nights a week "in order to enjoy living in Florida the rest of the time." The assistants are his brother, Lt. Robert Lee Mosley (inspiration for "Stretch") who flew A-20's in World War II, and Alec Delich. Sometimes the trio is accompanied on flying trips by Zack's charming wife, Betty—whom Zack cheerfully confides "is my favorite model as a Li'l De-Icer." Zack and Betty were joined by Jill Martin Mosley in 1947, described with reserve as "the cutest, smilin'est baby you ever saw." Sure, you've seen her. Even though she's much younger, little Jill is already inspiration for "Melody," daughter of "Stretch" and "Cherry" in a "trailervet" episode.

"'Smilin' Jack' incidents are based on true-to-life flying experiences," explains Zack, "or within the realm of possibility. We avoid fantasy. Many of the characters are patterned after friends of mine. Of course, this does not apply to the villains."

He is painstakingly accurate in the portrayal of planes and in human-interest settings for the adventure strip. During the war, when the cartoonist aided recruiting of "Wacs" and "Waves," he visited their posts to sketch them from life. Perhaps the greatest appeal of this "airman's artist" is the fact that his aviation details are instantly recognized by the flying fraternity as the work of a brother pilot who mixes and mingles with 'em at every opportunity. A stickler for accurate atmosphere, he spent a couple of days at a college trailer village recently visiting an ex-G.I. friend to get the feel for the sequence starring "Stretch" as a modern "houseless veteran" who had to add a room to the family trailer for an expected blessed event.

(Continued on page 45)

Forsgate for Flyers

(Continued from page 18)

made right on the farm. Maybe just for a "Hamburger California." Or maybe to be talked into a Forsgate exclusive, called "Donut Royale" (do-nut, ice cream, chocolate sauce, and maraschino cherry — you can take it or leave it alone).

But if you've got time, accept the ever-ready hospitality and drop over at the club. The welcome is waved before you even get down out of the air. Hands on the line keep a sharp look-out for strange planes, and when they spot one in the pattern, the red "Follow Me" Jeep is dispatched to the runway. The club is only 200 yards from the flight line, but a station wagon saves you the walking, and totes your golf clubs and hand bags — or maybe just your appetite — to the club.

At each set of white-painted brick gateways to the club is an eight-room guest house, and beyond it, a circular drive winds under low-hanging branches of the elms to a porte-cochere in front of the clubhouse of colonial South Jersey design, long sloping roofs, receding gables, tall brick chimneys, and thick, hand-hewn shingles.

Inside, it's clear the old boy didn't miss a trick.

Central room in the building is a spacious lounge with a high beamed ceiling, knotty pine floors, panelled walls, hooked rugs, chintz drapes, and a fireplace at each end. The furniture is pine, each piece copied from a museum item.

And if this isn't boring you, I'll go on to the terrace-porch, the cocktail lounge and bar, the dining room overlooking the 18th green, the spacious locker rooms, clean showers, immaculate powder room, all appointments in the best of country club tradition. Upstairs are rooms for overnight guests, roomy, their gabled windows overlooking the soft hills of the New Jersey countryside.

To top it all is the golf course, built to suit all the sporting fancies of our retired millionaire. Each hole is a replica of a famous green either here or abroad. Its par of 70 requires the skill of a champion. Many of the greens are 100 feet in width.

It's time to quit dreaming and check the tab?

O.K., sit back and relax, oh fugitive from cinder-filled swamp, dusty runway, and grimy airport shack.

Meals are from 75c for breakfast to $1.25 for lunch and $1.75 and up for dinner. Overnight rooms are $3.00 per. Greens fees are $2.00 weekdays and $3.00 week ends. Riding at the ranch is $2.00 an hour. Tie downs are 75c a night, hangars, $1.50. Rent a whole guest house with beds for eight for $24.00.

How come all this? That's where the story of John A. Forster comes in. Forster was an insurance man, a wealthy insurance man, in New York City. In 1913 he started a 100-acre experimental farm as a hobby. He began with a breeding farm for pure-bred Holstein dairy stock and Percheron horses. Extra milk he sold, and gradually the herd grew. To provide feed and silage, the farm, still strictly a hobby, grew in acreage. Forster combined his name with his wife's maiden name of Gatenby and formed the "Forsgate" trade name.

He wanted to prove that a modern farm could be self sufficient, so he built a canning plant, added a truck farm, greenhouse, apple orchards, a tea room, and homes for 30 employees. Chickens came next, and more land was acquired to grow feed for the chicken barns. Then, despite the crash of 1929, Forster plunged into the country club idea. It was built for him personally and just for his friends and guests. In 1931, the club was finished, but that year Forster died. There was over a million dollars in the club and the farm — and every cent of it in the books in red ink.

Management of the farm was turned over to Forster's son, and then to his grandson, young, able, modest, John Forster Abeel, the present manager.

Abeel, confronted with this circus full of white elephants, set out to make them show a profit. Eliminated were the tea room, the green houses, the Percherons, the orchards — anything that didn't look like profits. The club was closed down.

Then, in 1936, the farm got over the hump, and for the first time showed an ability to make money. Since then, the farm has continued to grow to its present 1,600 acres. The dairy is now the

(Continued on page 44)

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TRAIN IN MIAMI -- AIR CAPITAL OF THE WORLD

Forsgate for Flyers

(Continued from page 43)

largest Grade A dairy in the state, bottling 23,000 quarts of milk a day. There are 14 cow barns, and an 800-head herd. The ice cream plant makes 100,000 gallons of ice cream a year. In seven laying houses, there are 7,500 laying hens, and the farm hatches $250,000 worth of chicks a year. All the hay and silage used is raised on the spot. The farm has its own feed mill.

Incidentally, Forsgate has the answer to cries that "air traffic will ruin our egg production schedules" heard so often by the owners of embryonic airports scratching for a place to locate. Forsgate made actual inquiries into records of other large chicken farms near airports before he went into the airport business. The universal answer was, "It doesn't make any difference."

Forsgate laying houses which "trap nest" their layers for accurate laying counts, have since reported no drop-off in egg production. This despite a traffic pattern which brings the planes within 100 feet of the top of the houses. Nor has any pure-bred Holstein yet "dropped" a stillborn calf, despite cries from anguished neighbors of projected airports all over the country who claim such would result from noisy planes during calfing.

After the farm showed a profit for a couple of years, Abeel began wondering what he was going to do with his biggest headache —the $355,000 country club he had put in moth balls.

His answer to that one was typical.

Rather than let it die a graceless death, he decided to give it a shot in the arm — and revive it with a little dose of aviation.

He figured that a couple of airstrips across from the field would bring in cash customers who otherwise wouldn't bother with a long trip into the country. He figured that pilots in general would welcome a new kind of pilot's lounge. He figured that he could cut a couple of sod strips across one field, and still save all the rest of the field for crops. He figured publicity from the Airpark wouldn't hurt his ice cream and milk business either. He figured a lot of things — and what he came up with is a tribute to forward looking business practices which see in aviation not a fly-by-night, live-on-a-shoestring venture but a coming way of life.

So Abeel opened the club again, and made it available to any pilot dropping in.

Around him, 31-year-old Abeel gathered a group of young, progressive assistants. "Pancho" Hunker, former Navy pilot is president-manager of the airport at 30. Augie Boyd, club manager is 31. General manager of the farm is the grandpappy at 42.

These men know aviation is no longer a rich man's luxury, and that profits in the future will come from office clerks who have learned to fly, from farmers, from college students, and from every day Americans. The rates at the Airpark are set accordingly, and there is not a prophet of gouge on the lot.

Interestingly, the establishment of the airpark has actually proved the theory of Forsgate's founder — that a co-ordinated group of enterprises centered around a farm could be a successful thing. As a result, last year, 40 of the airport's 75 acres were planted in wheat, and yielded 120 tons of straw for the barns after the wheat had been threshed.

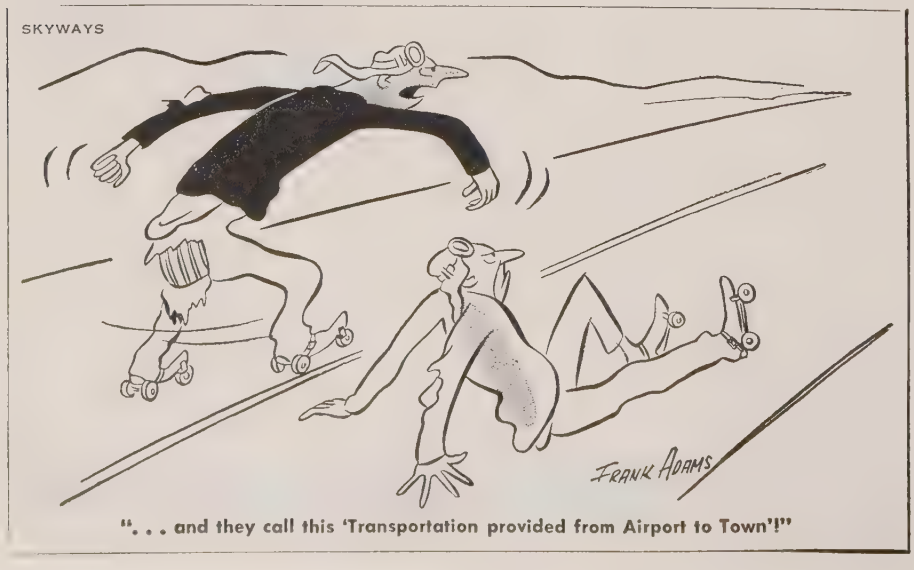
Abeel also figures the club to be a plush spot for company conferences, with executives flying their associates down for a round of golf, cocktails, dinner at the club, and back to metropolitan Philadelphia or New York airfields before dark.

Also, with the hotel situation in New York still acute, an air commuter to the big city can stop short of the metropolitan area, spend the night in the cool of the country in accommodations without parallel, and then make the short flight to the city in the morning. If such customers are the worrying type about weather the next morning, there is always the main line of the Pennsy railroad at New Brunswick, a short drive in the Airpark's station wagon. This puts New York only 40 minutes to an hour away, with trains running every 15 minutes.

And to get away in the morning, you're right next door to your airplane, in open country away from the early morning "smog" that plagues the city of New York.

The scheme has the imagination, of Forsgate's founder, and the resourcefulness of his enterprising grandson.

Abeel, informal, almost shy, explains it simply, "We just hated to be quitters."



"... and they call this 'Transportation provided from Airport to Town'!"

'Copter on Call

(Continued from page 35)

accepted the assignment. Prindle flew two round-trip flights to Block Island that day, modestly commenting at the mission's completion that, "It was a little bumpy."

A more humorous island incident occurred when Paule Loring, editorial cartoonist for the Providence *Evening Bulletin* called the New England Helicopter office to say that an old sea captain friend of his was marooned by heavy ice-floes on Patience Island in Narragansett Bay and had run out of smoking tobacco. Paule said that as the captain was too old to change his habits, he probably would be forced to smoke seaweed until his supply of tobacco was replenished. Loring wondered if New England Helicopter could ease the situation.

The sea captain's eyes popped as he saw the helicopter land on his ice-locked island prison, but as he stuffed the bowl of his clay pipe and puffed contentedly, it was clearly evident that the new fangled machine called a helicopter had won the admiration and praise of the salty old sea dog.

The unpredictable weather in New England has long been a source of concern for operators of all vehicles of transportation and this fact has given New England Helicopter Service a wealth of experience flying under many varied conditions.

One helicopter used for training purposes was flying early of a spring morning, when the voice of the tower operator at the State Airport in Hillsgrove, Rhode Island, came through the speaker loud and clear, "Helicopter NC10H, are you still airborne? Are you still air-borne? We cannot see you! We cannot see you! OVER." Pilot Albert Marcoux, Flight Instructor for New England Helicopter Service, pressed his throat mike button and replied, "Providence tower, we are still air-borne and hovering over the upwind end of Runway 28." Thus in a fog so dense that the tower operator could not see a plane in the air just a few yards away, helicopter operations continued when all others had long been grounded.

The Providence *Sunday Journal* carried an article which told of a helicopter which flew to Norwood, Mass., on a routine mission. On the return trip, an unpredicted snow storm of severe intensity struck New England and caught the helicopter in its blurring whiteness. The storm raged, but the helicopter with Pilot Marcoux again at the controls, was in no great danger, for by descending vertically with no chance of collision, he was soon able to make out objects on the ground below. By rechecking his bearings, Marcoux was able to confidently head for the home base in the dense clouds of swirling snow, and he landed safely just a few minutes behind schedule.

The actual experience gained by the New England Helicopter Service illustrates the complete versatility of the unique machine. High-velocity winds, turbulence, fog, and snow have failed to ground the helicopter. At the same time the safety of the passengers on such flights was not jeopardized.

Of all fields of aeronautical development today, it is certain that progress in the advancement of the helicopter will prove to be one of the most beneficial in the line of public service.

MORE *MERCATORS* ORDERED BY USN

U. S. Navy has ordered an additional 12 Martin P4M-1 *Mercators*. This brings to 19 the current production schedule on the P4M. This land-based patrol plane is powered by four engines — two P & W *Wasp Majors* and two Allison J-35 jets. It has a range of 3,000 miles and top speed said to be "high."

Smilin' Jack

(Continued from page 42)

Zack flew for 18 months with the anti-sub patrol of the CAP for the Army off the Florida coast. Next, as a War Department Wing Commander for Florida for two years. He now has over 2,000 hours of solo flying time. Once during the War, on special assignment, he flew to South America as co-pilot on an Army Air-Sea Rescue PBY. His main assignment in S. A. was putting on 30-minute shows of stories, pantomimes and sketches for GI's at Caribbean and South American air bases.

Zack's interest in sport is cosmopolitan. He loves flying, fishing, golf, flying — and flying. He's wrapped head over heels in the strip, which has been appearing for 15 consecutive years — in Sunday form since 1933, and daily and Sundays since 1936. Every flyer is his friend—which may explain his deep inner satisfaction—above and beyond fascination for aerial adventure—when he gets tangible evidence of "doing something real for aviation." Just the other day he heard from a Kansas legislator who intends to introduce a special air safety law in his State. "I'm calling it the 'Smilin' Jack Bill,'" the legislator wrote.

Hammering away at common-sense safety in the air, plugging for a system of clearly marked skyways, he envisions an America of tomorrow when aviators will get the breaks.

"Our country has the finest system of landing fields in the world," he says. "All we need now is to bring the towns to the fields."

In short, Zack is crusadin' again—against elapsed waitin' time, walkin' time and taxi time. Against "quickie lunches and a cuppa coffee." He thinks that the answer to isolated airports, from which flyers often spend more time getting to the communities than they did flying in—is "more and better Skytels, sky camps, air havens. The highways of the air will come into their own when air tourists are supplied with the same convenient, high-type, reasonably priced lodging and good food which opened up America's highways."

Others may wait for the towns to move to the ports. Not Zack. Chairman of the Florida State Chamber of Commerce, Aviation Division, he brought a couple of hundred members of the Sportsmen's Pilots Association to Florida this Spring on a five-day jamboree, which accentuated his desire to give air tourists a break.

In typical "Smilin Jack" style, he's setting an example with plans for "Cavu Harbor," an idealized air accommodations development on the edge of a decommissioned Navy airport, now a municipal field—and practically in his back yard.

"Planes will be able to taxi right up to the cottages. There'll be a yacht basin."

Civilian pilot friends can pick oranges in the front yard or step from the cottage door into fishing cruisers to enjoy a turn at Stuart's famous Gulf Stream sailfishing . . . coconut palms and night blooming cereus under a Florida moon will give tropical charm to this planned Skytel.

"Guess it would be too much to have uniformed valets for them, now wouldn't it?" Zack asks dreamily.

Decidedly. Pilots who drop down—like "Captain Henry"—into this aviator's dream-spot-to-be ought to be satisfied with Zack's concept of the routine in humanity. Nothing fantastic. Just, let us say, a bevy of "Li'l De-Icers" serving orange juice . . . True-to-life characters such as we see every day in "Smilin' Jack."

"Ratta-tatta-tatta-tat."

"Junior, puhleeze. Lay off. Your sister is not 'The Head.' 'The Head' is dead. Hand Pop the funnies—I mean that subconscious indoctrination course on safety in the air."

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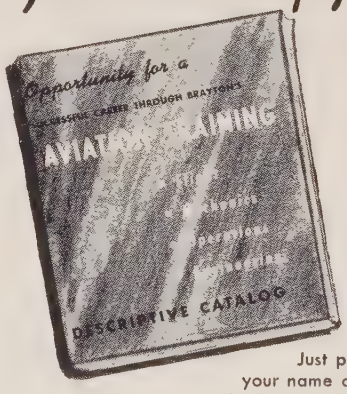

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Flight by Night

(Continued from page 28)

During the day a city is identified by its size, patterns of roads, rivers, and railroads, its position in relation to other cities, and to a lesser extent, its shape. At night, rivers, rails, and highways lose their importance, often are useless.

Shape is a major factor at night. If you've never flown at night, you wonder where the cartographer ever got the idea the city was shaped as he drew it on the map. At night it becomes obvious. The outer edge of the city lights follows a pattern that is almost identical with the shape on the map.

Expecting the city is an important key to night pilotage. That's the value of good preflight work. Knowing the city beneath should be South Podunk makes it a lot easier to identify.

If it is a moonlight night, or a particularly clear one, rivers, large bodies of water, and railroads will help by reflecting light. Large bodies of water can be spotted even on a dark night by the complete absence of light. Again, this is only reliable if you're *expecting* it.

Major highways are helpful if the traffic is heavy. You can see the headlights of the cars, and even determine the bends in the roads. This is particularly useful near large cities and on weekends.

Avoid using small towns as check points unless they are in isolated areas. Picking a small town in a congested area is extremely difficult at night unless it can be done with reference to another landmark. General terrain features aren't much help unless, like mountains, they stand out against the horizon.

The other group of check points — the lights — are your best bet on night hops. They are not only good check points in themselves but are a big help in positively identifying the above mentioned points.

These beacons are provided by federal and state governments, and at times by private interests, to facilitate night flying. In addition, markings and operating procedures have been standardized to avoid confusion.

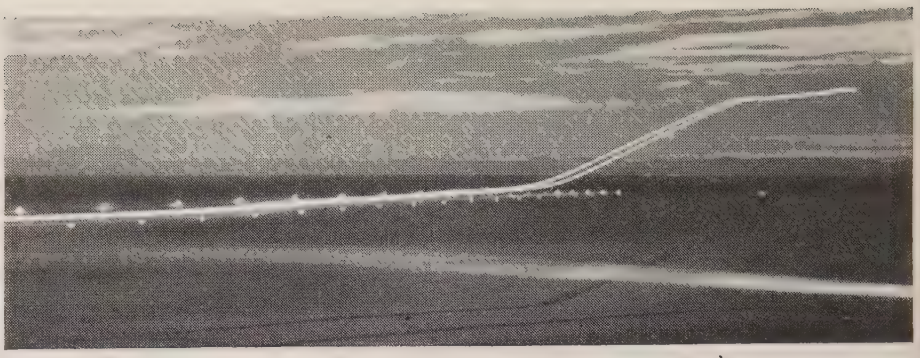
Anyone planning a night flight should become familiar with the different types of lights and how they may be identified from the air. They are listed at the bottom of all aeronautical maps.

The most common is the rotating beacon, indicated by a star with a white circle center. All beacons are colored magenta on the map.

The rotating beacons are white lights placed 10 or 15 miles apart along the airways, forming a chain of lights extending from the origin of the airway to its termination. These beacons operate two lamps projecting beams 180° apart. The beacon makes six revolutions per minute. The pilot sees 12 flashes of light each minute.

Most of these rotating beacons are equipped with two additional lights known as course lights. These are indicated on the map by two arrows pointing away from the beacon symbol in the direction from which the course lights may be seen. These lights do not rotate.

The course lights also indicate the availability of airports. The course lights are green when the beacon is adjacent to a lighted airport, yellow when near an unlighted one, and red when no airport is near.



LANDING PATH of plane is shown in night shot of ship coming in with landing lights on

To aid in identification of the particular beacon, the course lights flash a Morse code letter corresponding to the number of the beacon. These numbers and the proper code signal are indicated next to the beacon symbol on the map.

The number of the beacon on a particular airway is one-tenth of the distance from that beacon to the origin of the airway. For example, a beacon marked 29 would be 290 miles from the origin of the airway. The next beacon would be marked 30 (or 28, depending on the direction of flight), meaning 300 (or 280) miles from the origin.

The second digit (if there is one) is the basis for the code letter. A beacon marked 16 (160 miles from the origin) will flash the code letter for a number six beacon, which is —.— or K. The letters corresponding to the ten digits are as follows:

1. W .--	6. k -.-
2. U . .-	7. D -. .
3. V . . .-	8. B -. . .
4. H	9. G --.
5. R .-.	10. M --

A pilot can easily navigate from one city to another by following the light lines *if* there is an airway between the two cities.

Some rotating beacons do not have course lights but flash a code (non-directional beacons). These are indicated on the map by a rotating beacon symbol with short lines radiating out. Code is marked next to it.

Beacons which do not rotate are marked with a solid star. If it flashes a code, it will have lines radiating from it and the code marked.

These two beacons are usually found at airports. On maps, the beacon symbol is usually placed within the airport symbol or close to it.

Many beacons marked on the map will have letters next to them to aid in identification, such as FL to indicate a flashing beacon, F for Fixed, ALT. for alternating, etc. LF or L next to an airport symbol indicates the field is equipped to handle night traffic.

Lights marking obstructions are marked on the map by radiating lines in a circle. These are red blinking lights. Marine lights are marked by a large dot, light ships by a figure representing a ship, with a star on the mast. Marine lights are not too reliable because they are aimed low and are usually facing only out to sea.

In choosing maps, be sure to cover the adjacent areas. One hot pilot whose course ran along the edge of the map didn't think it necessary to include maps of the adjacent area. Of course, the inevitable happened. A strong cross-wind blew him off the map to the unmapped area. Enough said.

Use sectional maps. Keep away from regionals unless you have a very fast ship and it is radio equipped. Keep your maps up to date. They are re-issued every six months, with corrections for your benefit, by the Coast and Geodetic Survey, Washington, D. C.

In preflighting for a night hop, it is important to compute ETA's not merely to destination, but to each check point. The importance of this cannot be over-emphasized. Knowing a check point is due makes it that much easier to identify, and it is an immediate warning if you are off course or have made an error in computing groundspeed.

As in day pilotage, check weather for winds, allow for drift and variation, and plot the course. Draw the course line on the sectional and look over the route for check points at about 10-mile intervals. Remember you're flying at night.

On a piece of paper mark the check points and the ETA for each check point and for destination. Check the points on the map.

Note the check points on the proposed night hop from Newark Field (A) to Mansfield Airport (G). The first check point is the town of Utica (B). Although it is small, it is a good check point because it is not in a congested area, and it does have a definite shape. Groundspeed should be checked here and ETA corrections made.

The second point is the city of Mt. Vernon (C). The size and shape make this a good check point. If Utica should be missed, Mt. Vernon will be spotted easily. Check groundspeed again.

Now that we have three points (including the starting point), the track can be checked. A line drawn from Newark Field through the check points at B and C will give the track. The angular difference between this line and the course line (compass heading) will be the drift. Off-course correction should be made now.

Note beacon #24 west of Mt. Vernon. The white rotating light may be seen, but the course lights will remain invisible unless you fly across the direction indicated by the course light arrows on the sectional.

Beacon #25 is the next point (D). Note, however, that the course lights and hence the code (which will be .-.R for number 5) will not be visible until you are a few miles

(Continued on page 51)

Plane Sells Property

(Continued from page 25)

er *Super Cruiser* on floats. Next came the nzied activity of installing a small sa- ne float on the beach at Orcas, and con- ucting an ingenious dolly (which runs on cks cemented in the sand) so we could l the plane above the tides.

On May 22 of last year the plane ar- ed. We had one fare that day. We were business. On the 23rd of May, we made rangements to each morning take the doe brothers, well drillers living at Orcas, San Juan Island where they were work- ; and to bring them home each night. Before long, we had several groups of mmuters—carpenters, plumbers, etc., who ed in Anacortes and were working on pez Island. Mainland salesmen found ey could make in a day or less the calls at had been taking two days to make. he cannery manager found the *Cruiser* an icient way to make his frequent trips out the fish boats. Doctors made emergency lls with us, and sent their patients to ainland hospitals in our NC-4242M. The inister found he could preach on three lands each Sunday, instead of giving one one island and the next to another.

There were lots of laughs and there were me frustrations, as anyone who has run charter operation knows. A number of eteran airline passengers have told us that he flight from Seattle to the islands is the ost beautiful there is. We've even had me insist on paying more than our fare, express their pleasure in the trip.

On a day Pilot John Spencer condemned s too windy, we had five calls for the lane in an hour. Two passengers came ll the way from Seattle, with one happily sing the dual rudder as a foot rest and he polite pilot fighting it. He was ex- austed, but the passenger thought it was lovely trip.

Some days our first flight was at day- reak—and that's 4 a.m. in midsummer— nd our last at sundown. Some days the hone didn't ring enough.

One woman vacationing on the island ook her first flight with us and was so elighted she wanted a daily sightseeing rip. This was good for the exchequer, but ough on the pilot. Her brand of perfume, hich she used lavishly, was overpowering. he told John one day that she liked our lane because it had no unpleasant odors!

It wasn't unusual to make several flights Seattle in a day. This is not surprising; somuch as the 50-minute flight time con- asts more than favorably with the four six-hour trip by the standard ferry and r-or-bus combination. Within a period of ree months we carried about 800 passengers nd put 500 hours on the *Cruiser,* which abled it to make all its own payments to e bank, pay its own insurance, gas and aintenance expenses, and the pilot's salary.

Of course we got a lot of personal pleasure ut of the plane, too, with overnight camp- g on small islands, quick trips to town, nd beachcombing, which is much simpli- ed by preliminary aerial survey.

We sold real estate with the ship, too. ow and then we entertained a suspicion at some real estate prospects were more interested in a free air-view of the beautiful San Juans than in buying property, but even the non-profit jaunts were good advertising.

Womanlike, I had contended that a lot of people wouldn't want to ride in a plane. This was when my husband was trying to convince me that a plane was really essential to island real estate. To answer my earlier contention he can now point out that we've had a lot of first flighters, and we've encountered a few real estate customers who object to flying — but we've never urged anyone to go if they didn't want to and we've never flown anyone who wasn't certain he did want to fly. We believe unwilling converts are bad for aviation.

We've never lost a patient, either. The operation was entirely successful in the case of all first-flighters. This we attribute to the skill and tact of Pilot John, and to what we call his "Grandmother rides."

We adopted that phrase one day when a man who had done some flying but did not like it, decided to let John fly him a short distance to his yacht. When we saw him later and asked him how the flight was, he replied, "Fine! He flew me as though I were my own great grandmother."

While we didn't actually make any money with the plane last summer, we had it at no extra cost to ourselves, and it proved a great asset in showing and selling real estate. In addition to that, we had the added benefits of a lot of advertising.

John went back to his cows last September, and we didn't use the ship during the winter — it spent the winter in Seattle having a major overhaul and more horsepower injected. But summer is here now, the *Cruiser* is ready—and so are we—for another season of seaplaning and selling.

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Jet School

(Continued from page 40)

students to "in flight" operation of the fast fighter. Then the class is split into two groups, one of which continues in the P-51 while the other begins the F-80 phase by going through the Captivair F-80 routine. The cadets' 30 hours of jet flight training prior to graduation are divided equally among orientation, formation and navigation flights.

Both the jet transition and aviation cadet courses have been integrated at Williams to provide Air Force tactical units with fully trained pilots for both jet and piston engine first-line fighter groups. Despite the seemingly rapid advance involved in the jumps through only three speed ranges, the jet training course has consistently emphasized flying safety and the proof of the success of the new-type accelerated program is the excellent record hung up since its inauguration.

Chanute Air Force Base—Airplane and Engine Mechanics, Jet Propulsion

No matter how well trained and proficient its pilots may be, no Air Force can remain operational for long if maintenance personnel lack the technical knowledge to keep the planes consistently in top shape. Hit-or-miss line training has no place in the upkeep of planes as intricate as the jets now coming off factory production lines. The maintenance courses at Chanute Air Force Base are intended to provide a nucleus of technically proficient enlisted personnel to keep pace with the influx of operational jet planes in service.

Similar in concept to the wartime mechanics' training courses except for prime subject matter, the airplane and engine mechanics course instructs enlisted airmen (new terminology) in the operational principles, periodic inspections, line maintenance and minor repair of jet airplane structures, hydraulic systems, electrical systems, instrument systems and power plants.

The basic course takes 20 weeks (eight shorter than the course for conventional aircraft) and approximately 72 men enter each week to go through a total of 600 hours of academic and practical instruction. The pre-requisites for entrance include 10 years of formal schooling, (completion of second year high or vocational school), or the equivalent, and minimum test scores of 90 on the Air Force's General Classification and Mechanical Aptitude tests, a bit more rigid than wartime expediency permitted.

After basic study of the airplane structure, Air Force orders, forms and charts, the student mechanic receives instruction in the use of tools and in basic maintenance procedures in safetying, soldering and the use and repair of plastic and synthetic materials. The next step involves the maintenance of all types of aircraft systems with

The major phase of the course involves emphasis on those involving the jet engine. flight-line inspection and maintenance under operational conditions supervised by instructors who guide the mechanics through practical engine trouble-shooting, text procedures, inspections and engine changes. The newest element in line training comes near the end of the course when the trainee studies the latest techniques developed for polar inspection and maintenance by pioneer Air Force operational groups.

"I'm ready to go . . . two swim suits, two overalls, two carburetors . . . !"

ADAMS

Chanute Air Force Base—Power Plant Mechanics, Jet Engine

Smaller and more complex in its studies is the highly specialized jet power plant mechanics course. Non-commissioned officers with flight-line experience are given preference in making up the eight-man classes started each week. The course is 10 weeks in duration, compared to 12 required for the conventional power plant mechanics, and the students must be qualified graduates of the basic airplane and engine mechanics course to be eligible.

The program gives generalized training in the repair and operation of jet power plants and includes instruction in the operating principles, adjustment, removal, disassembly, repair and assembly of major engine units and accessories and in engine change procedures.

The course is divided into four phases, each emphasizing both academic instruction and "learn by doing" practical work. The first phase includes studying the operating principles of gas-turbine engines, constructional features of major engine components and types of repairs, special tools and equipment. A total of 93 hours is spent in the removal, disassembly, cleaning, inspection, minor repair and adjustment and installation of major engine units.

The second phase deals with engine accessories, including operating principles and construction features, operation of test equipment and the removal, maintenance and installation of accessories. The third phase covers the operation, adjustment, test and winterizations procedures on the complete power plant, while the fourth deals with engine removal and preparation for storage and shipment, ground run-up and post-engine-change adjustments, and ends with specialized polar maintenance problems.

The newest types of jet engines and complete aircraft are used for instructional purposes as they become available so that the graduate mechanic will be fully familiar with the latest planes going into service as he returns to field duty.

The courses both at Williams and Chanute Air Force Bases are the primary steps in effecting a transition to a modern jet Air Force. Both officers and enlisted airmen have to be indoctrinated with new standards of flying and technical efficiency to cope with present and future levels of tactical speed ranges.

In addition to providing the "core" of the new independent Air Force, the jet trainees in the air and on the ground aid in the formulation of the best possible training procedures for the men who come after. As in the past, the lessons learned at Williams and Chanute by both instructors and students may be needed to provide for a rapid expansion in training at any time, any where.

Thinking ahead is required in more than just the operation of an airplane—even current events seem to move at jet speed these days.

Editor's Note

According to a recent release from the U. S. Air Force headquarters in Washington the new designation for fighter planes will hereinafter be "F" instead of the "P" designation used up until now.

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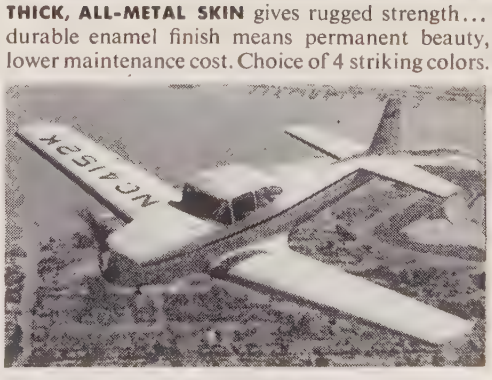

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The Thoroughly Proven Post-War Plane *Ryan Navion*

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Pilot's Report

(Continued from page 21)

repaired with a welding torch and a bucket of dope. That's the thought behind this metal-wing and fabric-fuselage design.

Aside from the wing, the new Aeronca is strictly a conventional plane built with two primary ideas; ease of flight and low cost. There are a number of parts interchangeable with the smaller Aeronca *Champion* and *Chief*. Control wheels, hinges, instruments, glove compartments, seats and rudder pedals are the same on all models and that helps keep tooling costs down on this new model. Production expense is lowered by using only a single cabin door, sliding windows on one side only, brakes and an adjustable seat on the pilot's side only and a simplified instrument panel.

One of the most popular points in the design of this new plane is its plenty of cockpit room. There is more than enough knee and elbow room for even the six-foot-or-better pilot. And the back seat is spacious when compared with many four-place planes. Interior upholstery is of high quality and the soft green and tan color is easy on the eyes. The seats are well padded and quite comfortable and the designers have been able to keep the cabin noise level remarkably low as long as the windows remain closed. There is plenty of space for the 120 pounds of baggage allowed. A B-4 bag presents no problem.

Why not join us on our 28-hour westward ferry flight, and find out the merits of this new plane. The entire flight was made with three passengers, a full load of baggage, and all kinds of weather, mostly bad.

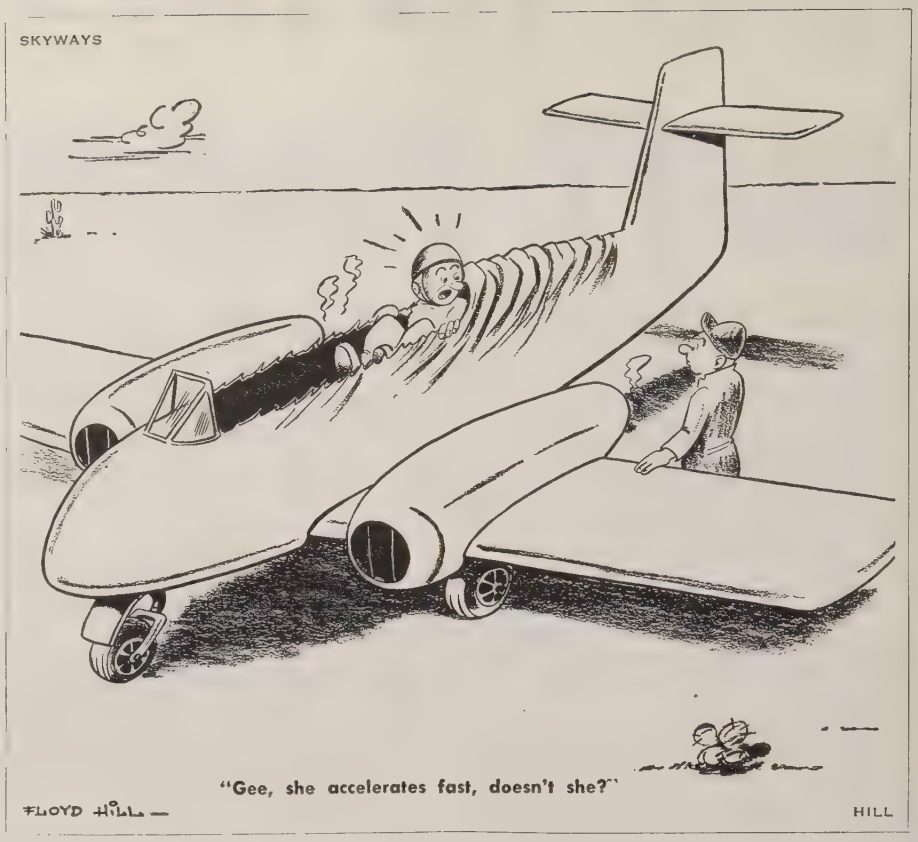
Early this summer the weather was anything but good for a hundred-mile-an-hour airplane headed West. Had we been going toward the Atlantic, our flight time would have been about 50 per cent shorter for there wasn't a single mile of the trip that we didn't have headwinds of from 20 to 50 mph. Cold storm fronts, towering cumulus thunderheads and dust storms made this a good "shake-down" flight for the new Aeronca.

A pre-flight check on this four-placer is as simple as on any two-place plane. The smooth-running electric starter eliminates the hazards of hand cranking and within a few minutes we were taxiing out the sod runway at the Middletown Airport. The *Sedan* has a rather stiff landing gear and it bounced over the taxiways cut-up by recent rains.

Our first take-off was quite a surprise. The plane picked up speed quickly and seemed to hop into the air at about 50 mph. We headed south and circled the Lunken Airport at Cincinnati. Only the hangar roofs showed above the muddy flood waters of the Ohio River.

As this particular ship had not had its radio installed yet, we didn't try to fly the airways and so headed cross-lots for Terre Haute, Indiana. *Sedans* coming off the assembly lines at Aeronca now are equipped with Hallicrafter Skyfone trans-receivers, a very fine bit of radio equipment.

In flight, the Aeronca is very stable. We tried some stalls that broke easily and cleanly, straight ahead. Then we trimmed the airplane for hands-off, level flight and stamped down hard on one rudder. The nose veered sharply but returned at once to its original position as soon as the pressure was released. The plane responded smoothly to all controls.



Since this complete trip was made under such changeable weather conditions, a really accurate speed check was impractical. The plane averaged out, however, at its advertised speed—about 112 mph at 5,000 feet, and 105 mph at sea level. On this particular production model there was some parasite drag. The metal cowling between the landing gear was not flush with the fuselage and the half-inch gap did cause drag. Adding to the drag was the position of the elevators in level flight. The counter-balance section of the control remained nearly an inch above the plane of the horizontal stabilizer when the plane was trimmed out. We noticed this unusual characteristic only after having a map sucked out of the window in flight. The map caught on the stabilizer and stayed there until we landed at Terre Haute.

The *Sedan* lands easily. Except for the longer nose housing the 145-hp Continental engine, a pilot could just as well be landing an Aeronca *Chief*. The brakes are excellent but it is difficult for a pilot with big feet to keep from riding them while taxiing. This is something, though, that would go by the boards when the pilot becomes accustomed to his new ship. Fuel consumption was an even 8 gallons per hour.

The CAA Weather Bureau forecast 40-mph headwinds on the nose and we debated about taking off at all. Only after the Weather Man advised that it would be fairly calm at 10,000 feet did we taxi out and climb out to the West. The 166-mile flight to East St. Louis, Illinois, took an even and a half hours.

We landed at the Parks field in East St. Louis. Because of the gusty surface winds, we were tied down as soon as the prop stopped turning. Here a gas attendant fueled the plane promptly, but forgot to replace one of the gas caps. Let that be a lesson to cross-country pilots—always check your gas caps. You'd be surprised to know how many careless field attendants there are, and if you want security, you'd better keep track of things yourself. The plane took its first quart of oil: it burned only three quarts on the whole trip.

Our last hop of the day was to Boonville, Missouri, where approaching darkness and a "Modern Cabins" sign on the airport office roof made a landing seem appropriate. Standard equipment on the *Sedan* includes cockpit, navigation and landing lights. The factory explained that landing lights were included as standard equipment because the wing had to be wired for them anyhow and the actual lights were comparatively inexpensive.

After the usual pre-flight inspection the next morning, we took off for Albuquerque, New Mexico. Roaring headwinds pounded us all the way and with it some pretty rough riding. But everyone soon became accustomed to it. We stopped for gas at the Cutter-Carr field in Albuquerque, and while the gassing was going on, we took time out for a leisurely cup of coffee. Here, as at every field we stopped, the Aeronca *Sedan* created a great deal of interest. Crowds of pilots and mechanics milled around the ship and gave it the going-over of physicians at a post-mortem.

Although sorry to have to break up the fun, we had to be on our way, and so took off for Gallup. Almost all the way over we had to wind our way around scattered snow flurries. Light rime ice formed on the wing struts as rain and snow leaked out the bottom of the broken cum-

ulus clouds. With full carburetor heat, the smooth-running engine never missed a beat.

At Gallup, the take-off performance of the Aeronca again proved amazing. This 6,500-foot-high airport demands a long roll from most so-called "light airplanes," but the *Sedan* literally hopped into the air. Into a brisk 20-mph wind, we climbed to nearly 500 feet before crossing the boundary.

The flight from Gallup to Prescott, Arizona, is second only to the Grand Canyon in sheer natural beauty. The Painted Desert, Meteor Crater, the bright blue of Mormon Lake fringed with tall pines, "Bloody Basin," scene of many Indian wars and the huge open pit copper mines at Jerome all rolled under the wings of the Aeronca in two and a half hours of scenic beauty.

Prescott is unique in its accommodations for the transient pilot. With paved and lighted mile-long runways, they boast both a good cafe and overnight cabins on the field. At the request of three of the flight instructors on the airport, we took a full load of pilots up over town. Without exception they were very favorably impressed with this new plane.

"This ship gets off the ground better than anything we've got on the field," remarked the instructor behind the wheel. "It ought to be a good airplane for any high-altitude airport operator."

From Prescott we wandered over the hot desert toward the Colorado River. Ventilation in the *Sedan* is the only problem. With no openings but the two sliding windows on the pilot's side, it takes considerable juggling to divert enough fresh air into the cockpit without blowing the passenger in the left rear seat almost out of the airplane. If the rear window alone is opened, the air circles around the cockpit and hits the pilot in the back of the neck. If both windows are opened, maps, chewing gum, navigation aids and any loose articles on the pilot's side are apt to be sucked out by the air rushing from the front window. Snap vents or wing root-section ventilators will be needed badly in summer weather.

Our last stop was at the Lake Havasu fishing resort on the edge of the Colorado River. Year 'round bass fishing and two 6,000-foot runways make this resort (marked as Kingman Auxiliary Site 6 on most maps) a mecca for sportsmen pilots. Here again the *Sedan* was the center of attention among both pilots and by-standers.

The hop from Lake Havasu to Los Angeles is over some of the most barren country on the map, but the reliable six-cylinder engine didn't seem to mind a bit and we finally delivered the *Sedan* to dealer "Hank" Coffin at Vail Field, all in one piece.

In 28 hours and 10 minutes in the air we had burned 241 gallons of gas and 3 quarts of oil.

Considering the extremely unfavorable weather, the trip was very comfortable and the Aeronca *Sedan* showed surprising high-altitude performance. Like the other Aeronca models that have always enjoyed popularity with pilots and passengers, the new *Sedan* is bound to be included on any list of good airplanes. Whatever shortcomings showed up in the model we flew, one of the first off the assembly line, are bound to be corrected, but as far as we are concerned, the *Sedan* is another good Aeronca.

Flight by Night

(Continued from page 46)

past it. Beacon #26 will become visible at the same time.

The town of Belleville (E) is the next check point. Ordinarily a town this size would be a poor check point and might be confused with Fredericktown. However, the code signals of beacons #25 (.-.) and #26 (-.-) positively identify the adjacent towns. Besides, with an ETA for Belleville, its identity is assured.

The city of Mansfield (F) is the final point before the field. Suppose, however, that a strong southwest wind prevailed from take-off and no correction was made. When the ETA for Mansfield expired, you would be over Ashland (X) instead of Mansfield. How would you know you were over Ashland?

The difference in size would help, but if you were not able to compare the two, you could not positively identify Ashland on the basis of size alone. Each city has an airport to the north, making the similarity greater. In addition, the cities are shaped roughly the same.

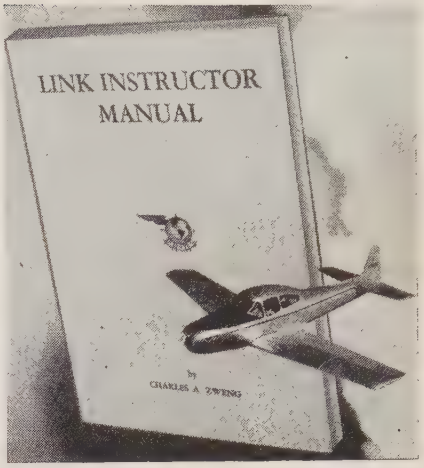
The airports would be the strongest points. Mansfield Airport has lighted runways, (note the LF) and has a rotating beacon. Ashland has neither beacon nor runway lights.

In addition, to fly to Ashland necessitates flying over beacon #27. The course lights flashing the code letter D (- . .) for a number seven beacon will be visible, and the error in course will be noted.

Finally, a few points to keep in mind when navigating at night:

1. Before making a night trip get your eyes accustomed to darkness, and avoid looking at lights.
2. Keep the cabin lights off, and don't stare at the instrument lights. Study your maps with dimmed flashlight.
3. *Know* your instrument panel.
4. If possible, avoid flying at dawn or dusk. Navigation is particularly difficult during those hours. Remember that a moon is a big help.
5. Don't become over-absorbed in your navigating. Remember that other planes are in the air. Keep your eyes open.
6. Know what to expect before you take off. Study your maps. ETA's to check points are important.
7. Keep checking groundspeeds and ETA's.
8. Don't lose your head if you get lost temporarily. Don't change course or fly in circles. Check back to your last *sure* check point. Using groundspeed and track (or airspeed and compass heading, if you have nothing better), measure off the distance for the elapsed time. Look for a check point in that area.
9. Learn to navigate from map to ground —and—from ground to map. It's particularly helpful to be competent at both when you're lost.
10. Finally—and this applies to all methods of navigation, day or night, *never stop navigating*. Never be so sure that you don't check and recheck with all means available. Navigating is a full-time job that pays off in safety.

LINK TRAINING!



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Dilbert

(Continued from page 36)

clouds have rocks in them.

c. Don't attempt unnecessarily steep turns on instruments, especially at low altitude.

d. Keep a constant check on altitude and attitude. Before engaging in low-altitude maneuvers, make certain your altimeter is set correctly.

e. Beware of attempting to orient yourself by reference to lights, unless their identity is definitely established. A light which you think is on the ground, actually may be in the air, and vice versa.

f. Avoid thunderheads and heavy squalls if at all possible. They represent turbulent conditions of such intensity as to cause possible loss of control or structural failure. In severe turbulence, your gyro horizon may tumble, so you must be adept at flying "partial panel".

In the final analysis, safety during instrument flight depends on your ability to fly through instruments. This takes a thorough understanding of your equipment and plenty of practice, both in the Link and in the air. You must be able to analyze accurately expected weather conditions on your route, and it is absolutely necessary that you become an expert in making instantaneous changes from contact to instrument.

Remember, it is the first few seconds that count most when flying into the soup, so don't get panicky or try to fly part contact and part instruments. Go completely on instruments immediately and be safe.

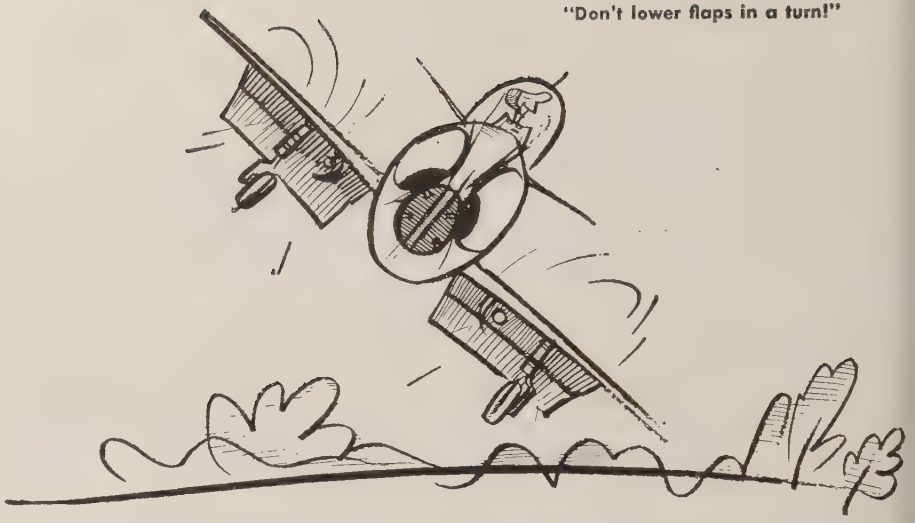
Advice To Fledglings—There is no sense in trying to invent new types of pilot error. Every mistake has been made a thousand times by guys preceding you.

On the other hand, it is smart to know what mistakes student pilots are prone to make, so you can avoid them.

It so happens that the majority of student accidents can be traced back to failure to follow a baker's dozen of simple safety rules, listed below. Since they are self-explanatory, all palaver is omitted. But, believe me, they are important! Follow them religiously!

1. Know And Obey Civil Air Traffic Regulations.
2. Believe Your Instructor.
3. Fasten Your Seat Belt.
4. Check Fuel Supply Before Taking Off.
5. Check Controls Before Taking Off.
6. Be On The Alert For Other Traffic.
7. Climb Sensibly.
8. Land Straight Ahead If Engine Fails At Low Altitude.
9. Avoid Flat Turns.
10. Maintain More Than Just Enough Flying Speed.
11. Never Stretch Your Glide.
12. Turn Back Or Land When Weather Is Doubtful.
13. Go Around Again If Your Approach Is Too High.

"Don't lower flaps in a turn!"



FLY LIKE A VETERAN!

Don't Lower Flaps In A Turn — Dilbert was practicing landings in a speedy, jet job. Everything went according to Hoyle for awhile, until on one landing he lowered his flaps while in his final turn at an altitude of approximately 125 feet. The airplane stalled, fell out of control, and crashed.

A rough understanding of the aerodynamics involved should convince any aviator of the danger of lowering his flaps in a turn at low altitude. Everyone knows that because your wings are banked, you lose lift in a turn. Lift may be increased either by increasing speed, increasing the angle of attack, or by lowering flaps. Lowering flaps, however, always introduces another factor, drag.

It isn't difficult to compensate for this extra drag in level flight, but it may be confusing in a slow-speed, gliding turn. It must be taken care of by steepening the glide path or increasing power, or a combination of both, as necessary to maintain flying speed. It may be impractical to further steepen the glide path at low altitude; in any event, to do so greatly modifies the approach path mentally selected by the pilot.

The best advice is to put your flaps down in the straight-away, or if you must put them down in a turn, know what the reaction will be. Use throttle, keep plenty of airspeed, and don't *stall!*

Lure Of The Water Witch — Why is it that so many young aviators can fly along the countryside for hours, seemingly intent on their work, and yet become bewitched the moment they see open water?

The size of the body of water apparently has little bearing on the matter. Anything from the Atlantic Ocean to a pond no larger than a tablecloth seems to have the same effect. It lures them down, and before they regain their senses they are buzzing it.

Not everyone who succumbs to this lure gets hurt, but any pleasure they get out of it is dearly paid for by those of their friends who are not so lucky. This is too high a price to pay for fun. Hence, strict enforcement of flight regs is necessary to prevent weak-willed pilots from yielding to the enchantment of this dangerous water witch.

Will Prop Disappear

(Continued from page 41)

of advancement is continuing. The jets in Lockheed's first P-80's had a life of 12 hours. Today they are good for 2,000 hours. Hall Hibbard, Lockheed's chief engineer, predicts an eventual life of 15,000 hours for the jet, nearly twice the 8,000-hour life span of the reciprocating engine.

The important virtue of the jet is its simplicity. This accounts for its fast development, and will be the reason it lasts longer than its reciprocating contemporary; there are vastly fewer parts to maintain and wear out. Also, it is smaller and lighter, meaning more room for payload and range. Already in use is a 4,000-hp jet weighing less than a piston engine of only 2,500 horsepower.

And this disparity in the ratio of weight to power between the two seems likely to increase. All that is needed is a more heat-resistant alloy for the turbine wheel. This wheel currently spins at a cherry red 1200 degrees. Raise that temperature capacity another 300 degrees, says Hall Hibbard, and the power of the engine could be nearly doubled. Or find some way to cool the turbine wheel; either solution is good for the same result.

The quest for both . . . new alloys or cooling . . . is now preoccupying the entire aircraft industry as well as the Air Forces and numerous public and private laboratories. How crucial this search is considered to be, and how secret its progress, may be gauged from the gateway guard who requires an accounting from all callers to the isolated premises of such a project being conducted for the Government by the California Institute of Technology at Pasadena.

Until the temperature problem is answered, no straight jet engine is going to drive a plane beyond the speed of sound, for the turbine wheel won't stand up to the heat attending the power output necessary for such speed. The power needed for this speed is tremendous. In the subsonic range, each 20 per cent increase in speed requires a 73 per cent boost in power. Beyond the subsonic range, a 20 per cent step-up in speed calls for 800 per cent more power.

Yet, speed is what the jet plane must have . . . more speed than as things stand today . . . to pay off, for as its speed goes up, its efficiency goes up. Twelve hundred miles an hour, well above the speed of sound, would be about right for top efficiency. The ship would then be running away at the same speed as the torch firing in the opposite direction.

The nature of the piston engine is in reverse to this; as power output climbs, efficiency goes down. The best balance between the two lies at about 60 per cent of power.

Therefore, since the jet engine wastes a lot of energy in the speed range to which it is still confined . . . 500 to 600 mph . . . and since the piston engine generally is taxed beyond its best efficiency before reaching this range, the logical thing is to hitch the propeller to the jet engine, combining the best features of the two systems of propulsion.

That is what is being done. Engineers agree that the turbo-prop plane is, broadly speaking, the real ship of tomorrow, serving in the interim needed to iron out the remaining problems of the turbine and the aerodynamics of ships suited to the speeds beyond tomorrow. There is still much to learn in design. Aside from such specialties as the Douglas *Skyrocket,* we still have nothing built to endure the hurricanes of sonic velocity.

Adapting the jet engine to the prop is fairly simple. On the P-80 engine it merely entails the addition of a drive shaft and reduction gears. Owing to the high speed of the shaft, this reduction must be about 10 to one, as compared to a two to one for the reciprocating engine, and it therefore means a little extra weight, but the total weight of the engine and driving mechanism is still far below that of the piston engine. Add to this the fact that the jet engine drives the propeller on less fuel than the piston engine, already shown in tests, and it becomes clear why engineers are hailing the jet-prop combination.

The combination requires no revolutionary changes in the design of the airplane itself. The Douglas DC-6 and Lockheed's *Constellation* and *Constitution,* the 180-passenger behemoth to enter Naval service this year, could all be converted to the new arrangement, to say nothing of various fighters and bombers.

That the propeller may thus be wedded to the race-horsy jet engine tells how effectively the propeller makers have responded to the challenge of the new propulsion. Time was, not long ago, when it seemed that the tips of a prop must be held below the speed of sound, or suffer undue loss of efficiency. Beyond sonic speed, the prop ran into the same compressibility effects which inhibit the ship itself in this range.

Thanks to 20 years of hard battling with this problem, props are now 90 per cent efficient, compared to 73 per cent only a short while ago, and sonic or even supersonic top speed is no longer out of the question. Where the limit lies nobody knows for sure. Though in jet harness, the prop still has to be held down to a tenth the speed of the shaft driving it, to keep the tips below sonic velocity, the Wright Corporation, speaking through a recent issue of *"Trade Winds,"* said, *"Future propeller development may make the turbo-prop a contender for flight above the speed of sound."* It is already pulling ships along at well over 500 mph, or decently close to the speed of pure jet ships . . . and with a great deal less expense. *"Refined propeller designs,"* said Hamilton's *"Bee Hive"* recently, *"now make it possible for the prop to exceed the efficiency of jets up to 600 mph."*

These results followed the discovery, during the war, that the potentialities of the propeller had been undersold. It had been thought that efficiency fell sharply after 400 mph was reached. Then such combat planes as the P-47, the P-51, with props rated for 350 mph, ripped through the air under the prod of necessity at 450.

This was interesting. The prop men got busy. By widening the blade, and by thinning and squaring the tip, they boosted speed to 500 mph before the onset of com-

(Continued on page 56)

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(Continued on page 56)

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(Continued from page 55)

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Will Prop Disappear

(Continued from page 53)

pressibility. Previously this had moved in at around 425 mph.

There is, of course, a limit to how far one may go with these expediencies. Added width, for example, while it provides a bigger bite on the air, makes for a structural problem because of the "excitation" factor. The wider the blade the more it tends to yaw. This calls for more strength, and more strength means more weight, calling for more power.

The wider blade, already up to 26 inches, permits shortening, to keep the tip speed down, but there is a point at which width no longer balances the reduction in length. Thereafter, efficiency drops. Ultimately, as the process of shortening and widening continues, the propeller approaches the same small address on the air as the intake vent of the jet, and about the same low efficiency.

When the best compromise in propeller design for the low side of sound has been reached, the only road still open for advancement leads to the sonic and supersonic. In making a propeller to operate at these speeds, engineers are governed by the same laws of aerodynamics as apply to the sonic and supersonic airfoil, for that is what a propeller is. As the airfoil becomes thinner, in deference to compressibility, so also must the propeller be made thinner. An accompanying procedure is to sweep back the tips, just as the wings and tail surfaces of certain jet planes are now being swept back. The object is the same: to delay, if not completely eliminate, compressibility.

But here, again, the gain is offset by losses. As the prop blades grow thinner, efficiency at low speeds declines, the same as the high speed wing under the same conditions. Chief Engineer Ed Heineman of Douglas' El Segundo, California, plant, says a supersonic prop can be built, now; the problem, as in the knife-winged speed ship, is not how to build it, but how to make it deliver on the slow and heavy hauls, such as in getting off the ground.

No doubt the answer to this will be found. This and other problems remaining in prop development are no greater, says Heineman, than the many conundrums which beset the transport industry when it began a quarter century ago, and which one by one fell away as knowledge progressed. Heineman points out that transport speed has increased at the rate of seven miles an hour a year since 1925, and he believes that this rate will go on for another 10 to 20 years yet, not ending until 600 mph is reached.

As to fighter craft by then, these will probably all have shed their blades in favor of jet, Heineman concedes, assuming that the progress of the jet engine, already up to where the piston engine stood in 1925, continues as it has in the past. Supporting this belief is the growing volume of jet warplanes now coming from various factories. North American at Inglewood, turning out a big order of FJ-1's for the Navy, has about 20,000 employees, more than during the war.

Hall Hibbard of Lockheed is somewhat bolder in his prognostications. He sees no reason to use propellers to drive any ship, military or otherwise, at 600 mph. "That's a hell of a tough way to make a living. You have to try too hard. Why use props when it's so much easier with jets?"

He predicts that by the time the 600-mph propeller transport arrives, everything will be jet. "There's a chance we'll be hauling freight at 600 mph, but that's about all."

Hibbard disagrees with many engineers that in the foreseeable future jet will remain too expensive for commercial purposes. Backing up his convictions is a commercial jet ship already on Lockheed's drawing boards. With this they expect to carry passengers for the same rates as present airliners, making up the added cost with twice the speed, or two trips for today's one.

However, it would seem that there would still be work for the propeller. It is unlikely, for instance, that feeder line operators, with runs of 50 to a couple hundred miles, could make these jumps profitably with blowtorch engines that don't reach efficiency this side of 1200 mph. Nor is it likely that you would want such an engine for your Sunday afternoon jaunts around the airport with the wife and kids. And militarily, to name at least one category, a jet-propelled grasshopper plane, whose prime value lay in its slowness, would be a contradiction in terms.

So, there you have some of the facts and opinions of the case: will the propeller disappear? Probably not any more than the muleback express, and for the same reasons: There will always be work only it can do.

But roll your own conclusions

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NEW VERSION of "Gibson Girl" permits voice sending

NEW RESCUE DEVICES

Engineers of Aero-Medical Lab at the Air Materiel Command, Wright-Patterson Base, Ohio, are continuously devising better rescue and life-saving devices. Among recent developments are a new "Gibson Girl" *(above)* and a better suit for fire fighting *(below)*. The new radio transmitter, whose power is derived from turning a crank, now has a voice channel as well as the coded "SOS." The fire-fighting suit permits wearer to be within two feet of 1500-degree fire, with body temperature rising only one degree.

FIRE-FIGHTING suit is made of aluminum foil on cloth

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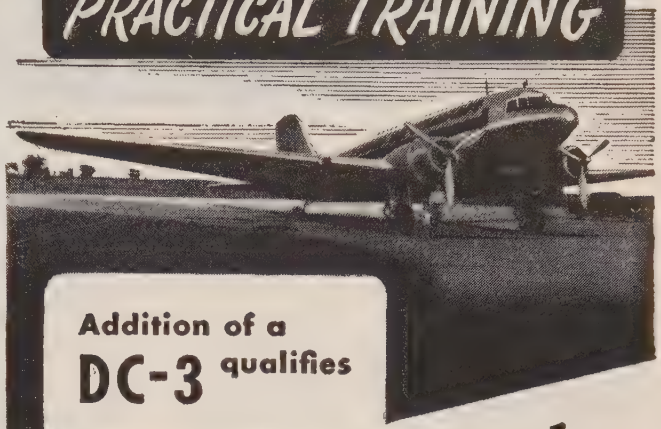

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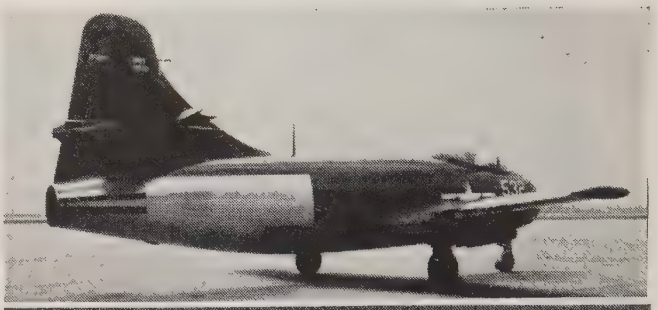
NEW... on the wing

CHANCE VOUGHT XF6U-1, called the *Pirate,* is now equipped with an after-burner which is reported to greatly increase the power of the jet engine for short periods of time. The after-burner is really an auxiliary jet unit, and will be a part of all production models of the XF6U-1. Designed and built for the Navy by Chance Vought, the *Pirate* has a rated speed of "well over 500 mph."

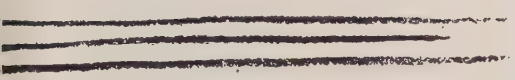


PIPER PA-11, with 90-hp engine, has now been approved for float operations. The extra 25 horsepower in this version of the *Cub* nearly doubles the rate of climb of the 65-hp version. With a gas capacity of 17½ gallons, the PA-11 has a range of over 300 miles. Seaplane pilots who fly the PA-11 on floats like the ship for both commercial and private operations on lakes because of its very short take-off run. The floats licensed for use on this *Cub* are Edo Model 1400, now available to buyers.

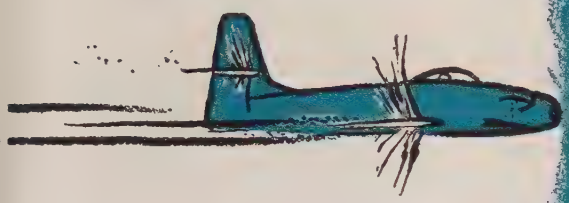
GLOSTER METEOR Mk. VII is Great Britain's operational jet trainer that is called "fastest in use." It has a top speed of 585 mph and climbs faster than any other jet yet developed by the British. Like trainer version of the U. S. F-80, the *Meteor* Mk. VII was designed to bridge the gap between comparatively slow prop-driven trainers and the high-speed jet-propelled operational fighter planes.

AVRO ATHENA Mk. I is a new three-place trainer developed for the RAF by the A. V. Roe & Co. Powered by a *Mamba* engine, the ship was designed as a training aircraft for new prop-jet engines. It has a top speed (at 10,000 feet) of 287 mph, cruises at 253 mph, has a rate of climb of 2,630 fpm and a range of 2½ hours. This range can be increased by installation of drop tanks under each wing.

COMPRESSIBILITY SENSE

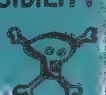


WATCH ATTITUDE



WATCH ATTITUDE

COMPRESSIBILITY DANGER STARTS HERE

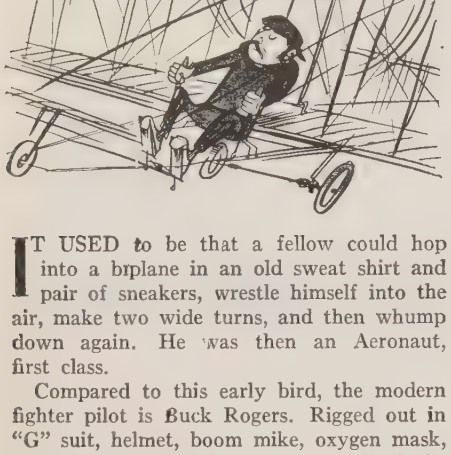


SUBSONIC

TRANSONIC

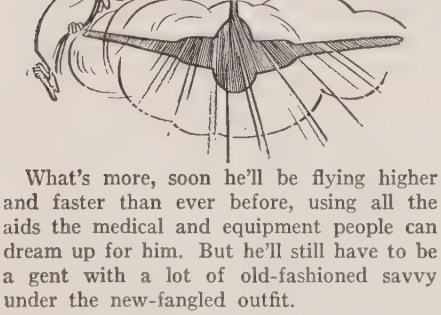
SUPERSONIC

COMPRESSIBILITY SENSE

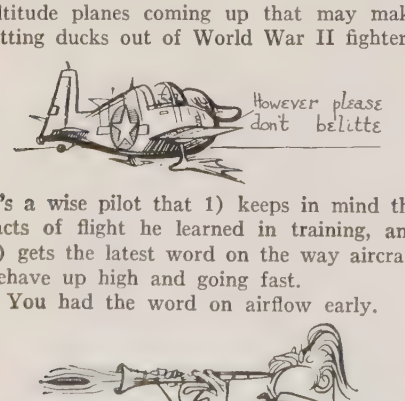


IT USED to be that a fellow could hop into a biplane in an old sweat shirt and pair of sneakers, wrestle himself into the air, make two wide turns, and then whump down again. He was then an Aeronaut, first class.

Compared to this early bird, the modern fighter pilot is Buck Rogers. Rigged out in "G" suit, helmet, boom mike, oxygen mask, and the rest of his paraphernalia, he looks like a deep-sea diver.



The explanation for the elaborate get-up is simple. He flies a) high, and b) fast.



What's more, soon he'll be flying higher and faster than ever before, using all the aids the medical and equipment people can dream up for him. But he'll still have to be a gent with a lot of old-fashioned savvy under the new-fangled outfit.

Speed plus altitude equals trouble for Dilbert. The trouble not only arrives faster but takes longer to shake off. With high-altitude planes coming up that may make sitting ducks out of World War II fighters,

it's a wise pilot that 1) keeps in mind the facts of flight he learned in training, and 2) gets the latest word on the way aircraft behave up high and going fast.

You had the word on airflow early.

"Move an airfoil through the air," said the instructor, "and the stream of air flows under, over, and around it. If the foil has a reasonably good pattern, the flow will be smooth and will conform to the shape of the moving foil. Set the foil at the proper angle of attack, make it move fast enough, and the airflow will sustain it in flight." Wind tunnel movies made the process seem even more reasonable.

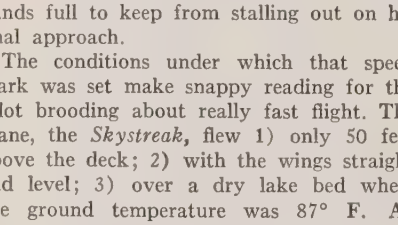
Cadet Blowitz wanted to know why the air is good enough to conform to the pattern of the foil. The answer was that in some way the molecules of air are warned of the approaching object and bend themselves into shape.

Similarly warned, all the other little molecules cheerfully allowed smooth passage. They even speeded up as the airfoil went by, which was all to the good.

Actually the molecules didn't warn each other. It was the pressure waves sent out ahead and in all directions by the moving object that told the molecules of air what was in store for them. These pressure waves moved at the speed of sound.

The instructor established a connection between airflow and the speed of sound.

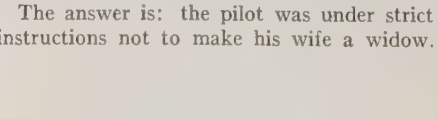
Dilbert didn't stir in his seat. He could guess that something might happen to the flow of air over a plane when the pressure waves did not have time to tell the molecules to assume the attitude, but why worry?



The speed of sound at sea level on an average day is about 662 knots (762.3 mph) and Dilbert knew that no operational aircraft were moving that fast. The world's speed record was only around 566 knots (651.7 mph); so there was no need to get his top in a tizzy about the stuff. Let the wind-tunnel boys stew over it. He had his hands full to keep from stalling out on his final approach.

The conditions under which that speed mark was set make snappy reading for the pilot brooding about really fast flight. The plane, the *Skystreak*, flew 1) only 50 feet above the deck; 2) with the wings straight and level; 3) over a dry lake bed where the ground temperature was 87° F. All these conditions had something to do with the speed of sound.

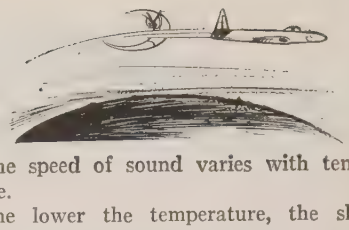
The news that any piloted aircraft can move through the air at 566 knots should



have made Dilbert bend an ear. This one zipped along at what amounted to sea level. It should be easier to move faster at high altitudes where the air is thinner and offers less resistance.

Why didn't they make the speed test upstairs? Granted the aircraft's power plant might fall off in efficiency at extreme altitudes, but why fly just off the deck?

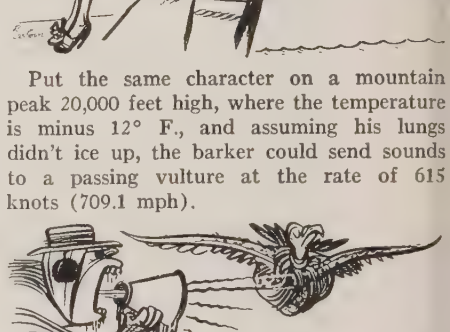
The answer is: the pilot was under strict instructions not to make his wife a widow.



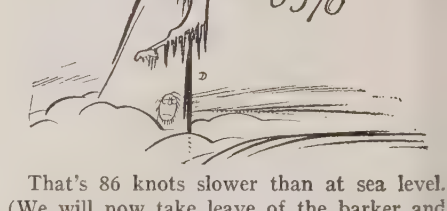
The speed of sound varies with temperature.

The lower the temperature, the slower sound moves.

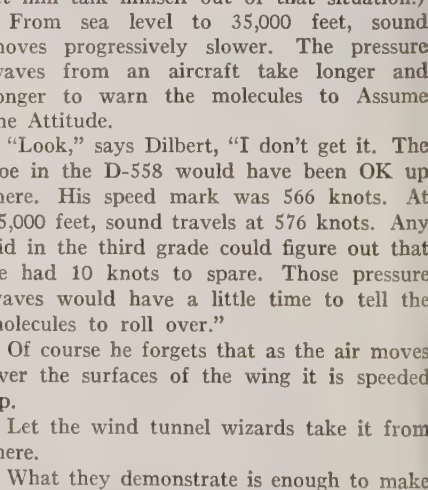
"Step up, gents," shouts the sideshow barker at sea level and his words make the passage from gold teeth to you at a speed of 662 knots (762.3 mph).



Put the same character on a mountain peak 20,000 feet high, where the temperature is minus 12° F., and assuming his lungs didn't ice up, the barker could send sounds to a passing vulture at the rate of 615 knots (709.1 mph).



Move him to 25,000 feet, where the temperature is minus 67° F., and sound speed drops to a mere 576 knots (663.2 mph).



That's 86 knots slower than at sea level. (We will now take leave of the barker and let him talk himself out of that situation.)

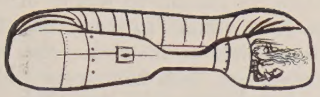
From sea level to 35,000 feet, sound moves progressively slower. The pressure waves from an aircraft take longer and longer to warn the molecules to Assume the Attitude.

"Look," says Dilbert, "I don't get it. The Joe in the D-558 would have been OK up there. His speed mark was 566 knots. At 35,000 feet, sound travels at 576 knots. Any kid in the third grade could figure out that he had 10 knots to spare. Those pressure waves would have a little time to tell the molecules to roll over."

Of course he forgets that as the air moves over the surfaces of the wing it is speeded up.

Let the wind tunnel wizards take it from there.

What they demonstrate is enough to make a serious thinker out of any hot rock. Up at 35,000 feet the air moving over an aircraft wing at 566 knots looks like the flow from a



five-cent cigar shot full of holes.

The leading edge of the wing smashes into the air. As the air flows back over the wing it is speeded up, actually exceeding the speed of sound under these conditions.

Since the pressure (warning) waves from the wing are sent out in *all* directions, how can they communicate with the molecules of air on the parts of the wing surface where the molecules themselves are moving faster than the speed of sound?

They can't.

Wind-tunnel pictures show what happens. About one-third of the way back on the wing, the compressed (speeded-up) air forms a shock wave. The air breaks away from the wing and burbles. The smooth flow vanishes. Pressure waves from the wing pile up with no place to go.

The wing is suffering from an acute case of compressibility, an often fatal disease.

An aircraft travelling at a true speed of over 560 knots at 35,000 feet will have several places on its surfaces where the airflow moves faster than the speed of sound.

When that happens, compressibility occurs.

Just what compressibility effects do to an airplane will be given the once-over lightly shortly.

Nobody but Dilbert imagines that an aircraft can travel one knot below sonic velocity and get by without a burble. He expected this one to move along at more than 98 per cent of the speed of sound at 35,000 feet, the kind of great expectation that leads to trouble.

So the D-558 pilot was not flying head up and locked when he went after the speed mark so close to the deck. At 50 feet, he was in less danger of approaching the speed of sound than at 15,000. In a straight-and-level attitude his angle of attack was smaller. There was not as much speeding up of the air over the plane surfaces as there would have been in even the slightest climb. He flew over an area with relatively stable air because he knew that a pocket of rough air could have speeded him up when he didn't want to be. Compressibility was just around the corner.

Compressibility means a stall. With the disruption of airflow, the lift factor changes. A shock wave means a shock stall.

Compressibility occurs when air moves faster than the speed of sound anywhere on the aircraft. The true speed of the whole plane may be well below sonic velocity, but the *local* speed—over the wing, around a drop tank where a venturi effect can be created—may be faster than sound. At those places the pressure waves cannot warn the molecules of air.

Compressibility effects are felt sooner at high altitudes.

"But," says Dilbert, "this doesn't mean a thing to a cookie like me. I'm no jet pilot. Though a fast character, I'm not setting any speed records. This is stuff for test pilots and other crazy people."

Tut,Tut.

A very pleasant but ill-informed fighter pilot named Ensign Horatio P. Scattigude was flying an F8F at about 33,000 feet. His indicated airspeed was in the neighborhood of 150 knots (172.7 mph). It was the spring of the year and Horatio felt pretty good.

"I can't pick flowers up here," he said into his oxygen mask, "nor yet cavort with a nymph. I can, however, go into a split-S." And he did.

Halfway through this interesting maneuver, he indicated 300 knots at about 28,000 feet. Laughing in a light-hearted fashion, Horatio tried to pull through.

Hm-m.

He couldn't budge the stick. Instead of wanting to come up like a well-behaved nose, this one wanted to "tuck under." Ensign

Scattigude continued to pick up speed. His plane began to wobble in a most distressing fashion.

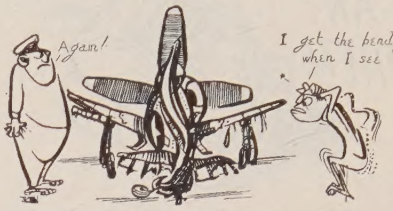
Compressibility rode with Scattigude.

It is a fact well known to many ghosts that only a few seconds are needed for an uncontrolled aircraft to fall thousands of feet. But luck rode with Brother Horatio too.

At around 12,000 feet, the air was denser, the speed of sound was greater, he regained elevator response and the nose started to come up Scattigude was not too far gone with the spring to realize that if the nose came up too fast, the "G" effect would pull his aircraft to pieces. So he pushed the stick forward as best he could and tried to take his time levelling off.

It was rough. Scattigude was bounced. He was buffeted. He almost blacked out. But at least he was level.

Sweating, he tested his controls. They seemed all right. He came in for his landing and that was rough too. It should have been, for the young man's plane was in need of major overhaul. The fuselage was twisted. The left stabilizer was bent. The fin was warped. Most of the fabric was gone from the elevators.



Does the sap rise within the young ensign now?

Not so. Scattigude was in need of an overhaul, too.

The "C" urchins had worked him over. When they finished knocking him around, they turned him over to the "G" men.

Scattigude was saved by his Buck Rogers outfit — "G" suit, shoulder straps, and so on — but it was almost not enough. Nothing will ever take the place of the old-fashioned gabboon or the brain.

At 33,000 feet, Horatio's true airspeed was in the vicinity of 260 knots. Flying straight and level and allowing for the speeding up

of air over the surfaces of his aircraft, the young man was well below sonic velocity, roughly 580 knots at this altitude.

He rolled his plane over and pointed the nose almost straight down, giving it the old one-two: 1—He picked up speed very, very rapidly in the thin air. 2—He changed the angle of attack radically, exaggerating the relative speed of the air over his aircraft.

Compressibility caught up with him at about 28,000 feet. The investigators had to assume this because Scattigude's account bordered on the incoherent. The tip-off was

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COMPRESSIBILITY SENSE

(Continued from page 61)

his almost complete loss of stick control and the "tucking under" of the nose.

The airflow was disrupted. Scattigude's wings were in the familiar shock stall. The factors built into them so carefully by the designers were thrown out of whack. The air burbled about one-third of the way back from the leading edge. There was a radical change in pressure distribution all over the airfoil. The usual flow from wing to tail was broken up. With less downward push on the tail, it was natural for the nose to "tuck under." So many forces were working on the elevator that Scattigude couldn't pull up his wing.

Compressibility makes aerodynamic goulash out of a fine aircraft.

The really malicious trait of compressibility is that it pushes a pilot from a bad situation into a worse one. The longer it

works on a plane, the greater the difficulties of the unhappy pilot. His steep angle of attack becomes steeper, and he has to fight "tucking under" with all his might. The wings wobble a little at first and then tend to wobble more. Buffet on the tail surfaces increases. Unless the aircraft is brought under control, it cannot behave like a respectable flying machine.

It assumes the characteristics of a bomb.

That's right, Dilbert. The flight path follows the trajectory of a one thousand pounder, leading to violent collision with the ground—dandy for a bomb, but painful for a pilot.

Scattigude was kicked by a mule and saved by a rabbit's foot.

What happened was this. As he plummeted down, his plane entered progressively warmer air. The speed of sound varies with temperature. The pressure waves began to catch up with the air molecules again, begging them for the love of Mike to *Assume the Attitude.* They did, and the normal flow for which the aircraft was designed began to move over it. That's when the elevator answered his frantic signals and he could start to bring up the nose.

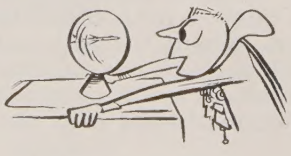
But he was still behind the flying 8-ball. He wanted to level off fast but he knew that as soon as he pulled back on the stick the "G" men would climb aboard. Scattigude had to face them.

More buffet, more wobble, almost a blackout.

He tried to ease out of the dive, but at that speed he was forced to put a terrific strain on his aircraft.

The pin-up of Miss Kansas City, Mo., no longer hangs alone over Horatio's sack. She now hides behind a tasty, hand-embroidered sampler which reads as follows:

Now back to the biplane and the sweatshirt.



High speed, like the improved Brussels sprout, is here to stay. Engineers are at work on new aircraft designs that will at least delay compressibility effects at near-sonic velocity and perhaps even bring piloted aircraft into the unexplored regions of supersonic speed. But that's in the future. Right now the problem is to obtain the fullest tactical advantage from high speed and still keep planes and pilots in good working order.

Until the newest jets are as common as beans in the Fleet, you won't have to worry much about compressibility in level flight.

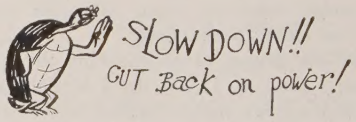
Not even the jets have reached the speed of sound. It's still a matter of watching *local* speed on some portions of the aircraft, jet or conventional. For a long time to come the really critical situation will be

attitude at altitude, just as it is now.

You won't be as helpless as Ensign Horatio because you have the word on what can happen to your aircraft at high speeds, particularly if you don't watch your attitude upstairs.

At the first sign of 1) buffet or 2) "Tucking under," you'll realize that "C" is upon you, that "C" leads to "G," and something has to be done fast.

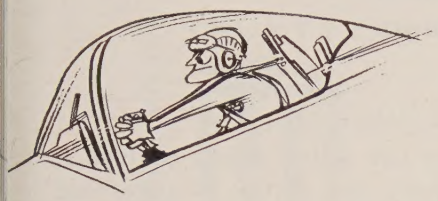
The greenest pilot with wings fresh from the Ship's Service knows the remedy is to slow down and get the nose up. Even Dilbert would reduce power. That would be Step Number One in anybody's book.



The new speed brakes can help, if you have them. At very high altitudes, the speed brakes do not have much drag-inducing effect but using them will help you get downstairs. At very low altitudes, the sudden drag created by the brakes may produce enough "G" to black out the pilot. Only Dilbert is more efficient when completely unconscious.

The savvy pilot knows the attitudes at which the speed brakes will take hold and slow him down without drawing the black curtain.

The big trick is getting back to a level
titude without pulling a plane to pieces.
ne nose must be brought up gradually,
herwise too many "G"-men hop aboard.
ne word is to use both hands on the stick,
pull back smoothly and firmly, holding
e wings level and the nose straight. Keep
e plane out of "buffet" and ride it on down.



If things get worse, pull back on the
ick with everything you've got. But be
epared to take the "G" rap.

The best way to avoid kicks is to stay
way from mules. Cousin Letty escaped
ark bite because she never even dipped
toe in the briny.

Compressibility is a rough deal. A smart
ay stays away from it before he gets the
C" shakes himself.

The best way to avoid compressibility is
o know your aircraft. The pilot of a
odern, high-speed fighter ought to be on
ne same terms of easy familiarity with his
lane as the whistler was with his dog or
Milwaukee with beer.

One way to meet a new plane is to meet
Mach first.

Applied to aircraft, Mach number simply means the ratio between true airspeed and sonic velocity. Fly 330 knots indicated at sea level and the airplane's Mach number is .5 or 50 per cent of the speed of sound. At 20,000 feet the same *indicated* airspeed give a Mach number of .735. Up at 35,000 feet, with the same indicated airspeed, the Mach number is 1.02—*faster than the speed of sound.*

The Navy's record-setting D-558, taking advantage of high ground temperature, reached a Mach number slightly below .83.

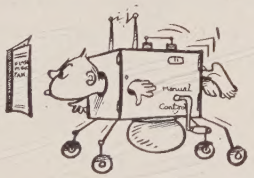
Every aircraft has a *limiting* Mach number. When it reaches limiting Mach, the plane may begin to porpoise or buffet. The nose may tuck under. The wings may wobble.

Sound familiar?

The "C"-boys have got it.

Know the limiting Mach number for your plane, with and without drop tanks, bombs, rockets, and the rest of the gear affecting airflow. The test pilots have already determined it for your aircraft. They have rolled it, dived it, made it porpoise, brought it to the buffet boundary, flown it high and low down.

Limiting Mach has been nailed down. Some of the newer planes even have a Mach meter in the cockpit to keep the pilot posted.



And like the booklet that arrived along with Aunt Hattie's new electric baby-changer, a piece of life-and-time-saving literature comes with every aircraft. It is called the "V-N Envelope" and was drawn up by the test pilots. Dilbert ought to throw away his comic book and have a look.

"V" stands for cockpit indicated airspeed.

"N" is for load or applied "G's."

The neat graphs show the speed and the number of "G's" a given aircraft can take at each altitude. They indicate the outer limits of safety. Stay inside the limits and you won't meet up with compressibility.

"C" plus "G" will always equal Whammo.

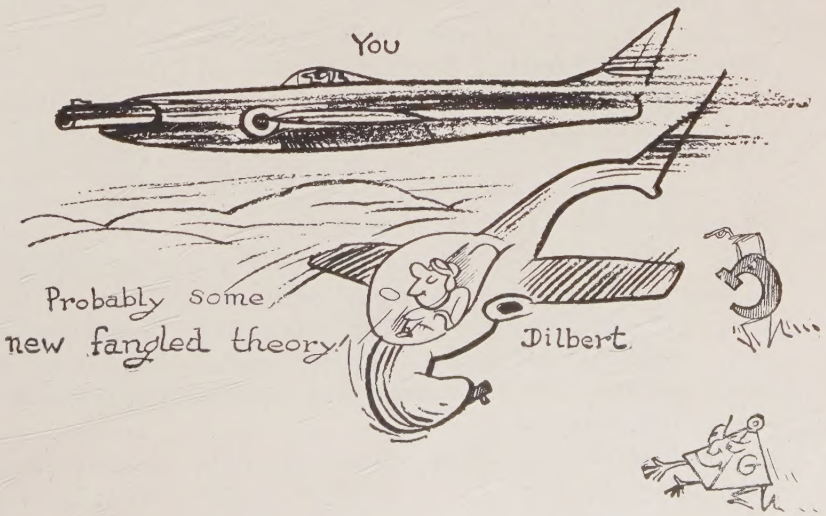
The pilot who makes the best tactical use of his plane flies up close to the V-N limits and does not go beyond them. He stays inside the envelope. He knows his aircraft.

Your fighter plane was designed for speed and would be a military dud without it.

Fly fast, but know where and when to do it. Watch that attitude upstairs.

Above all, keep an eye out for that old devil "C." Dilbert may not know his way around an airplane at high speeds and steep attitudes but old devil "C"—*he* knows.

Adapted from "Compressibility Sense," with permission of Director of Public Information, Department of The Navy.



The Axe Fell—Almost!

GI Flight Training program gets last-minute save from Congressional death

ONE of the most remarkable instances of the way in which our citizens can make Congress listen to them has just happened as we go to press. From a news standpoint, it will be old when you read it, but the story behind it is important.

Early in February, this year, the Director of the Budget, James E. Webb, sent to the Committee on Veterans Affairs of the House, a report stigmatizing flying under the GI Bill of Rights as 90 per cent wasted time and tax money, and classing it with dancing, music lessons and photography. The report had been requested by the Veterans Administration, long hostile to aviation training.

The Veterans Committee held extensive hearings, and aviation leaders were given full and fair opportunity to present the true facts in contrast to the prejudiced and substantially unrealistic picture which Mr. Webb had painted. Several bills were written and introduced in the House, some good, some not so good. The Committee itself had not made its report, and indications were that nothing would be done to change the status of flying training entitlement in this session of the Congress.

In the meantime, however, the powerful Appropriations Committee of the House had been hearing testimony from the Veterans Administration on its budget request for fiscal 1949. It called no aviation witnesses, although it later claimed to have consulted with various veterans' organizations and that it had received their agreement on the desirability of lopping off the training.

Suddenly, on June 8, the Supplemental Independent Offices Appropriation Bill, including the appropriation for VA, was reported to the House. In fine print was a rider reading: *"Provided that no part of this appropriation for education and training under the Servicemen's Readjustment Act, shall be expended for tuition, fees, or other charges, or for subsistence allowance, for any course elected or commenced by a veteran on or subsequent to July 1, 1948, and which is determined by the Administrator to be vocational or recreational in character."* The rider was discovered at three o'clock in the afternoon, Washington time, by local aviation people and the alarm was sounded from coast to coast. Telegrams and long distance calls began pouring into the offices of Congressmen—all to the same effect: *"Save civilian flying!"*

When the House met at two o'clock on June 9, 11 hours later, every one of the 49 states had been heard from. The telegrams alone ran into the thousands. The debate which followed was so significant for the future of this component of aviation that it should be read in full by everyone who believes that the private flyer is as important in his own way to our national security and economy as are the military air services.

At its end, the rider had been amended by consent, and the program *was* saved. Karl Stefan (R. Neb.), chairman of the sub-committee on aviation of the House Appropriations Committee, led the fight and proposed the amendment. Mr. Stefan was also a member of the Congressional Aviation Policy Board and is one of the best informed men on civil aviation in the Congress. He said, in part: "Several attempts have been made to abolish the veterans flight training program. To date, I and other Members have successfully opposed such measures. — Just as I am a foe of unbridled Federal spending, I am the enemy of false economy—which is most certainly the label for any measure which would remove (this) training from the GI bill. Reasonable objections can be raised over parts of the veterans training program—(but) those who compare ballroom dancing with flight training have devoted little study to the latter. It seems ridiculous to me that a Congress which authorized billions for the Air Force, would propose to abolish a program which has already trained thousands of men as pilots. Flight training is giving this country an invaluable pool of young men trained in the fundamentals of aviation."

There was much more—Stefan's amendment provided: "For the purpose of this proviso training for the purpose of teaching a veteran to fly in connection with his business or occupation in which he is now engaged or for which he is training shall *not* be considered avocational or recreational." The Veterans Administrator still has the last word — but Congress made its intent very clear that *no honest GI flight training should be interrupted.*

This is a victory for the United States and for aviation. Its moral is obvious. When the people speak, Congress listens.—J. FRED HENRY